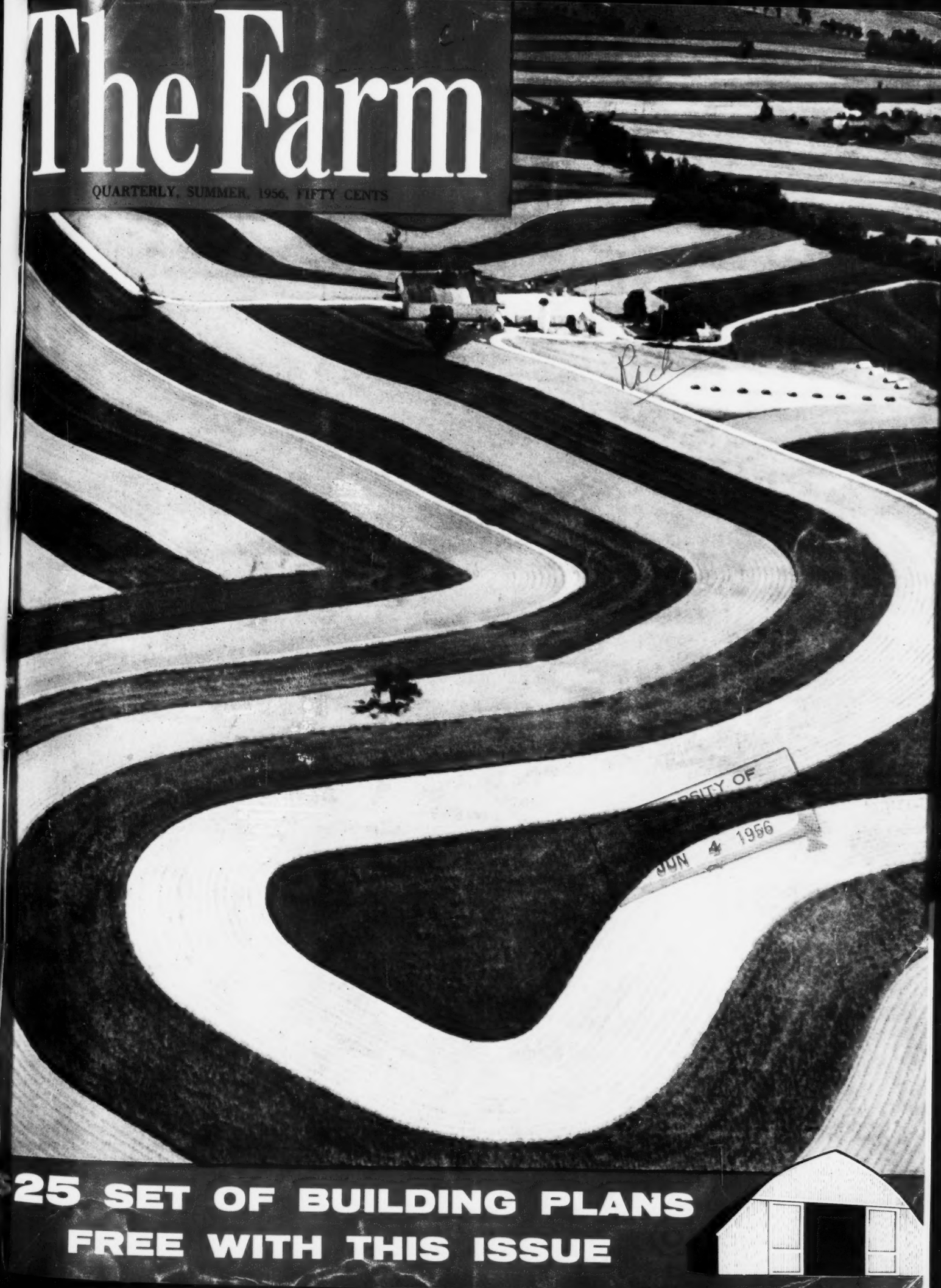
The Farm

QUARTERLY, SUMMER, 1956, FIFTY CENTS



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JUN 4 1956

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Why Roto-Beater-and-Tiller work goes faster with Wedge-*in* Action-

See why Super-Sure-Grip does more work, faster, keeps tire costs low—

EXCLUSIVE, RULER-STRAIGHT LUGS, coming closer together at shoulders (A) take a "wedge-in" bite that *firms* loose soil—gives "the greatest pull on earth!"

O-P-E-N C-E-N-T-E-R helps self-cleaning *ruler-straight* lugs bite deeper, pull better!

LONG, EVEN WEAR—*ruler-straight* lugs work evenly against soil, roll smoothly on road—and so wear slowly and evenly!

STRONGER BODY—added protection against bruise breaks and the wear and tear of tough service. Goodyear, Farm Tire Department, Akron 16, Ohio.

Such dead weight and dig-in demands super-traction—but you need more than just deep lugs to get it.

That's why Super-Sure-Grip husky lugs are "ANGLE-ENGINEERED" to *work their way* into the trickiest footing and—HOLD—to deliver real go-ahead pull! Here's the secret:

Unlike others, Goodyear lugs are ruler-straight—*and come closer together at the tire's shoulders.* This holds loose footing in place with a vise-like squeeze—sets up Goodyear's exclusive Wedge-In action that takes any farm job in stride! No wonder surveys show—

MORE FARMERS PREFER GOODYEAR TRACTOR TIRES THAN ALL OTHER MAKES *PUT TOGETHER!*

Look for this sign; there's a Goodyear dealer near you.

Super-Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio.

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Super-Sure-Grip Tractor Tires

TA gives 10 SPEEDS FORWARD

PLOW 10% MORE

with a McCormick® FARMALL® 300 or 400 tractor

Now, start and quit with the neighbors, but outwork them all with a Farmall 300 or 400! Pull the TA lever for two speeds in each gear—*10 forward and 2 reverse!* Match power to the load *exactly* to plow 10% or more in a day—to go acres farther between gas fills!

Call on a TA power-burst—up to 45% more drawbar pull—to keep going when others stall or shift down. Plow tough spots without time-killing shifting or gas-eating wheel slippage . . . without gimmicks that get you through by shallowing out!

Your IH dealer will gladly demonstrate your-size Farmall on your farm. Try Torque Amplifier, Hydra-Touch, Fast-Hitch, and other farm-easy features. Ask about the IH Income Purchase Plan of Buying.

SEE YOUR INTERNATIONAL HARVESTER DEALER

International Harvester products pay for themselves in use—McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Crawler Tractors and Power Units—General Office, Chicago 1, Illinois.

Change speed instantly. Pull the TA lever to reduce speed one-third . . . increase pull-power up to 45%. Stay in TA all day, if needed, or just push the TA lever to resume full gear speed.

Sod . . . steep slope, but no shiftdown! Pull the TA lever instead of shifting to keep going, *non-stop!* Plow nearly two extra acres daily with a Farmall 300 and Fast-Hitch 3-furrow plow.

Send for FREE Catalog TODAY!

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P. O. Box 7333, Dept. FQ-6, Chicago 80, Illinois

Tell me more about Torque Amplifier and other time and cost-saving Farmall advantages. Send catalog checked:

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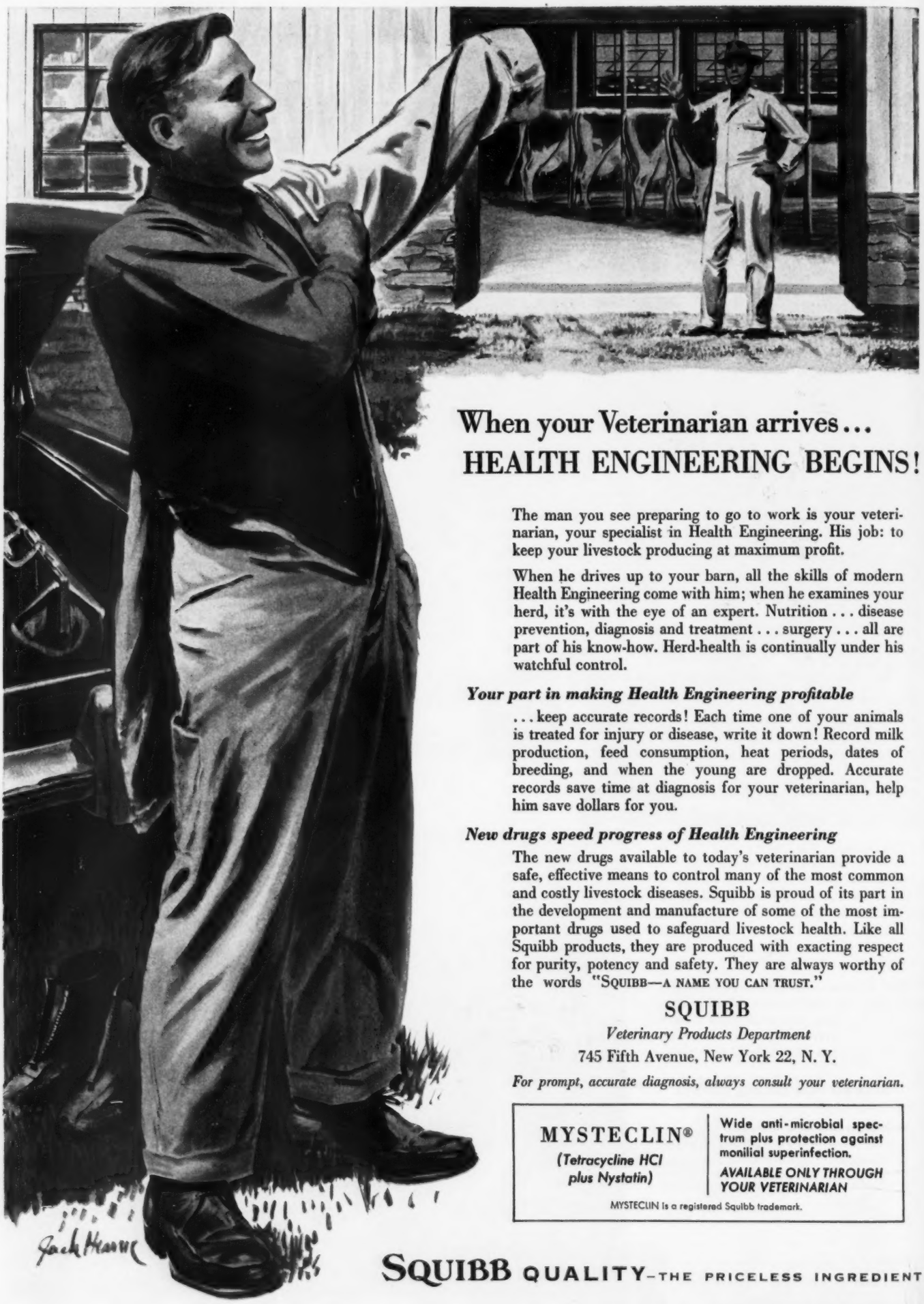

When your Veterinarian arrives... HEALTH ENGINEERING BEGINS!

The man you see preparing to go to work is your veterinarian, your specialist in Health Engineering. His job: to keep your livestock producing at maximum profit.

When he drives up to your barn, all the skills of modern Health Engineering come with him; when he examines your herd, it's with the eye of an expert. Nutrition . . . disease prevention, diagnosis and treatment . . . surgery . . . all are part of his know-how. Herd-health is continually under his watchful control.

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. . . keep accurate records! Each time one of your animals is treated for injury or disease, write it down! Record milk production, feed consumption, heat periods, dates of breeding, and when the young are dropped. Accurate records save time at diagnosis for your veterinarian, help him save dollars for you.

New drugs speed progress of Health Engineering

The new drugs available to today's veterinarian provide a safe, effective means to control many of the most common and costly livestock diseases. Squibb is proud of its part in the development and manufacture of some of the most important drugs used to safeguard livestock health. Like all Squibb products, they are produced with exacting respect for purity, potency and safety. They are always worthy of the words "SQUIBB—A NAME YOU CAN TRUST."

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Farm Quarterly, Vol. Eleven, No. Two. Editorial, Circulation and Executive Offices, 22 East 12th Street, Cincinnati, Ohio. Published quarterly by F. & W. Publishing Corp. Subscription price 50c a copy; $2.00 for one year; $3.50 for two years; $5.00 for three years. Add $1.00 per year extra for rates outside the United States and Canada. Entered as second-class matter at the Post Office, Cincinnati, Ohio, under the Act of March 3, 1879. (Title Reg. U.S. Pat. Off.)

Brand new New Idea mounted parallel bar rake, unique in the hay tool field, is exciting the interest of farmers throughout the country.

Here's a really exciting new rake from NEW IDEA

New mounted parallel bar rake fits 27 different makes and models of tractors, makes fluffy, quality windrows fast.

This is a rake that will really speed your haying the quality way — an all-new addition to the New Idea line of hay tools.

Unique in its field. Brand-new — the only mounted parallel bar rake that fits 27 different makes and models of tractors. Because it lifts, it maneuvers easily.

Cuts raking time. Rakes at higher speed with less leaf shattering. It can cut raking time almost in half. This is partly because this unusual new tool moves hay from swath to windrow with half the forward motion. A double driving sheave provides a choice of speeds to accommodate variations in ground conditions or tractor PTO speeds.

Makes fluffy, quality windrows. This new rake makes uniform, bunch-free windrows; your hay gets even curing. Puts leaves inside windrow and stems on outside. Handles hay gently in a smooth, lifting, rolling action. Also makes unbroken windrows on corners, so baler can operate without interruption.

This new rake really makes quality hay the New Idea way.

Watch for the arrival of this unique new rake at your New Idea dealer's. Write today for complete facts in new literature.

Best idea yet . . . get a New Idea

NEW IDEA FARM EQUIPMENT CO., DIVISION AVCO DISTRIBUTING CORP.

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- ☐ Mounted parallel bar rake
- ☐ Pull type rakes & tedders
- ☐ Booklet "Tried and New Ideas for Making Hay"

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Address_____

Town_____ State_____

NOW...A NEW FRONT TRACTOR TIRE THAT OUTWEARS TWO ORDINARY FRONTS

the great new Firestone GUIDE GRIP

Run the new Firestone Guide Grip on tricycle or wide front axle type tractors . . . run it in the toughest farm service and you will find it gives twice the service of ordinary front tractor tires. You get double the tire life and yet you pay no more than you would for a regular front tractor tire.

The new Firestone Guide Grip is years ahead in design and construction and it will help you cut your farm tire costs.

Ask your Firestone Dealer or Store to show you all the money-saving advantages of this amazing new tire.

HERE IS THE PROOF...

New Guide Grip — Two Regular Front Tires

On the left is an actual photograph showing a new Firestone Guide Grip that was run in actual farm service opposite each of the two tires on the right. You can see the remaining rib height of the new Firestone Guide Grip. The other two regular front tires are worn out, one of which has even worn into the cord body. This clearly shows the remarkable wear advantage of the new Firestone Guide Grip.

Always Buy Tires Built By Firestone, Originator of the First Practical Pneumatic Tractor Tire . . .

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC.

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SPREAD ALL HARVEST COSTS THIN

with the Versatile JOHN DEERE *45* Grain and Corn Combine

YOU harvest all your combineable crops, from small grain right on through corn, with the versatile 8- or 10-foot John Deere 45 Combine. This means your investment in this remarkable machine is spread over more acres —that you have less money tied up in harvesting equipment. And, with only one efficient, long-lived machine to harvest all these crops, your upkeep costs are lower, too.

Combining corn with the 45 Self-Propelled and No. 10 Two-Row Corn Attachment is today's most efficient method of corn harvesting. You can pick, shell, and clean up to 20 acres per day in a single operation. You cut field shelling losses by as much as 75 per cent.

See your John Deere dealer soon for complete details.

A FREE 36-page educational booklet on combining, drying, and storing of corn is yours for the asking. Also ask for a free folder on the 45 Combine. Write to John Deere, Moline, Illinois.

Above you see the 45 working in small grain. Notice that the operator sits up high, in cleaner air —that he has a good view of the crop.

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QUALITY FARM EQUIPMENT

JOHN DEERE
MOLINE, ILLINOIS

GET GOOD COW MILKING *NOW!*

Pay While You Use It...

Genuine Surge TUG & PULL

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Whether you have a very little herd or hundreds of cows — Organized Surge Service is the best guarantee you can get that your milking machine investment is protected.

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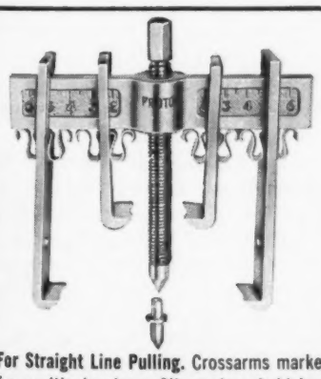

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The Farm QUARTERLY

Summer, 1956, Volume 11, No. 2

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THE FARM QUARTERLY
22 East Twelfth Street, Cincinnati 10, Ohio

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Autumn issue on sale Sept. 7 at all Class A newsstands.

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AUTOMATIC CONSTANT DRAFT CONTROL

AUTOMATIC IMPLEMENT POSITION CONTROL

When irregular ground or soil conditions tend to increase or decrease draft, the Vickers Servo Valve acts automatically to raise or lower the implement slightly. Movement is so smooth as to be almost imperceptible . . . with no sign of jump. Overloading, wheel slippage and stalling of tractor are prevented. Flipping a lever on the valve automatically provides constant depth regardless of ground contour or changing soil.

INDEPENDENT HYDRAULIC CYLINDER CONTROL

Addition of Vickers 3-in-1 Valve permits operation of pull-type and mounted equipment of all kinds independent of main hydraulic system but using same pump.

VICKERS. SERVO VALVE

Provides smooth, accurate and instant response to load or position changes of hitch tools. It is mounted inside the oil reservoir and has an external lever.

VICKERS. 3-IN-1 VALVE

Four-way directional valve with built-in flow control and relief valve is mounted externally to provide control for separate hydraulic system (front- or side-mounted equipment).

VICKERS. PUMP

Hydraulically balanced and having automatic wear compensation, this pump delivers more oil while taking less power. A single pump supplies all needs.

The new Oliver Super 55 Tractor demonstrates to excellent advantage the many benefits that Vickers Hydraulics offer the farmer. On the Super 55, a Vickers valve and pump are used to provide the 3-point hitch tools with either automatic constant draft or automatic constant depth . . . at the flip of a lever. By addition of the Vickers 3-in-1 Valve shown at the left, a separate and independent control system can be provided for operating front- or side-mounted equipment. Built-in overload relief protects against damage, while merely turning a knob on this valve changes the amount of oil flow for fast or slow operation.

This is another example of the many ways in which Vickers Hydraulic equipment is working on the farm . . . helping make a wide variety of jobs easier, quicker, more economical. The next time you buy farm machinery, it will pay you to make sure the hydraulic units are Vickers.

People who look for quality in tractors and farm equipment also look for VICKERS.

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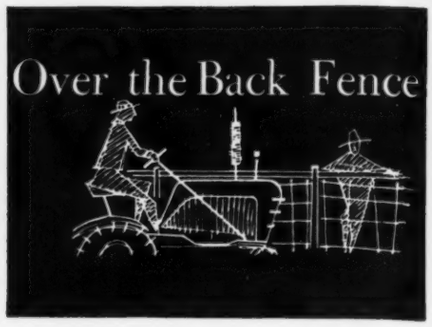
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



Who Gets the Mostest and Why?

Like Helen of Troy, who was all things to all men, a set of figures can mean anything to a statistician. For what the economists and farm planners want to make of it, we offer the average farm prices of wheat received by U. S. and foreign farmers during 1954-55. The unit is the bushel and the price is in U. S. dollars.

Belgium	$2.56
Ireland	2.44
Netherlands	1.87
Switzerland	4.11
United Kingdom	2.33
Denmark	1.96
Norway	3.08
Austria	2.53
West Germany	2.71
Greece	2.29
Italy	3.19
Portugal	2.82
United States	2.05

Thoughts on Farm Problems By City Fellers

A great deal was expected of the report on agriculture recently published by the Committee for Economic Development. This committee is a non-profit organization made up of the greatest intellects in American industry. Their efforts currently have been bent toward a study of the economic plight of the American farmer, and everybody was hopeful that with so many eminent brains working on the subject some colossal new idea would be presented to bring succor to agriculture.

The report, Economic Policy for American Agriculture, is a masterpiece of the obvious. The handsomely printed 44-page report tells us what we have known for a long time: (1) There is too much production of some farm products. (2) Farmers' incomes are highly unstable. (3) Many full-time farm families have too few resources to permit a satisfactory income.

The bulk of the report is devoted to a rediscovery of these problems. Its dry, obvious formality is about what one would expect from a mechanical brain. The solution, what we had hoped this industrial brain trust would provide, is a hazy, vague suggestion that before we can solve the problems we must (1) get rid of surpluses, (2) stabilize farm income, and (3) provide jobs in industry for marginal farm

(*Continued on page* 147)

You need more than . . .

Livestock Efficiency and Labor Efficiency

for *top-profit* results

You can have the *best* of livestock and poultry. You can be feeding enough of them to make good use of your labor and equipment. But . . . it also takes the *right* feed at the *right* time to make *top* profits.

That's why Wayne Feeds and Wayne feeding programs are favorites among farmers and feeders. They know from experience that dependable, efficient Wayne Feeds . . . combined with livestock efficiency and labor efficiency . . . bring them top profits.

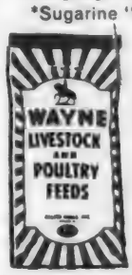
You can prove it to yourself by feeding the Wayne Feeds that fit your needs.

WAYNE has a feed to meet *EVERY NEED*

WAYNE FEEDS

For Hogs:
Brood Sow Supplement
Tail Curler Rockets
Tail Curler
Pig Balancer
Hog Balancer
H-A-D Krums
Hog Worming Mixture

For Beef Cattle:
Roughage Supplement "A"
*Sugarine "22" Beefmaker
*Sweet Mix
*Beef Balancer
**Available with Stilbestrol*



For Poultry:
More than 20 feeds for different needs.

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Ask your Wayne Dealer about the feeding program that can help you make the *most profit* from your livestock and poultry.

To help you make the best possible use of your farm grains and roughages . . . every Wayne Feed is manufactured for *high efficiency* performance through scientifically controlled *Ingredient Quality* and *Ingredient Balance.*

First, all ingredients are individually tested to determine their precise feeding values. Then they are blended according to exclusive Wayne Formulas and *triple-tested* for dependable results.

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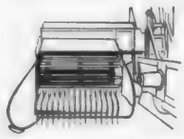
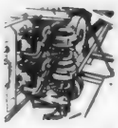
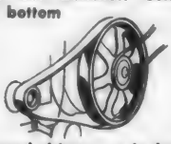


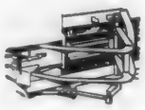
Vertical, undershot elevator levels out bunches. Solid table bottom



Proven knotter ties under compression, extremely accurate



Enclosed drives run in bath of oil. Heavy ball bearings



Needles pass through plunger — not the hay, less wear

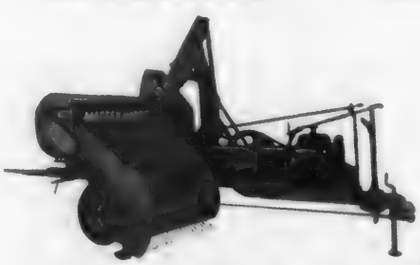
but bales 'em fast!

MASSEY-HARRIS SLICER BALER

LEAF-GUARD design — the Massey-Harris way of crop protection — starts at the small diameter pick-up that travels the crop a shorter distance. It continues up the solid table with its leaf-saving undershot elevator . . . through the enclosed cross conveyor with its gentle tumbling action . . . and on into the bale chamber where every charge retains a high leaf count.

With leaf-guard design the knotter ties under compression to capture more of the protein-rich leaves . . . assures highly palatable feed with more grow-power for livestock.

And the capacity to maintain leaf-guard efficiency is constant, dependable. A big, heavy flywheel keeps up uniform baling speed . . . perfect timing and accuracy that turns out firm 14 x 18 x 37 inch bales . . . tied tighter to take a lot of handling, to stay tied under storage.



NO. 1 ENGINE DRIVEN BALER

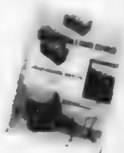
Powered by a 25 hp air-cooled engine, the No. 1 Baler turns out up to 7 bales a minute depending on moisture. Leaf-guard design saves more of the protein-rich leaves in every bale.

NO. 1 PTO BALER

Custom baler capacity at low cost. Heavy, belt-driven flywheel maintains correct power delivery for uniform bales.

Ask for a demonstration

See these big-capacity leaf-guard balers in action on your farm. See how they put new efficiency into haymaking. For folder write Massey-Harris, Dept. F-222, Racine, Wis.



Keep your eye on **Massey-Harris**

FOR BETTER FARMING, JOIN YOUR SOIL CONSERVATION DISTRICT

Floyd Hemling of Columbus, Wisconsin tells...

"Why we went DE LAVAL all the way..."

"When we decided to 'go pipe-line,' we did it to cut down the labor and cost of producing milk. We wanted equipment that would save the *most*—and produce the *most*. And we chose a De Laval Combine.

"We like De Laval's whole pipeline set-up. We like the De Laval Magnetic Pulsation Control because it gives us uniform milking and big production at every milking. We find the De Laval 'hand' is very gentle and efficient.

"And we like the De Laval 'In-Place' Washing System —we know it saves us plenty in water and detergent— to say nothing of time and labor.

●

"We went De Laval all the way, including not only the above but also a De Laval L. P. Gas Water Heater, Wash Tank and a De Laval Bulk Milk Tank—and we're mighty glad we did.

"When we made up our minds to put in a bulk milk tank, we naturally looked around at various makes.

"So far as we could judge, all those we saw would cool the milk O.K. and, probably, we figured, at just about the same operating cost.

"But the big thing in our minds was *dependability*. And it seemed to us that if anybody knew how to design and build a cooler that wouldn't give trouble, it was De Laval. We wanted dependability beyond all question, and we got it."

●

If you want equipment that will save the *most*— and produce the *most*... go De Laval—all the way! Get all the money-making details—now!

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Sealed Power "Hot Rod" tractor assemblies can boost the power of your tractors 10% or more, making them deliver greater power and more pulling capacity, with no increase in operating costs!

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Cylinder sleeves, piston rings, piston pins and pistons are all Sealed Power's finest, of the right design and right materials for the specific application. Ask your jobber!

Sealed Power

KROMEX RING SETS

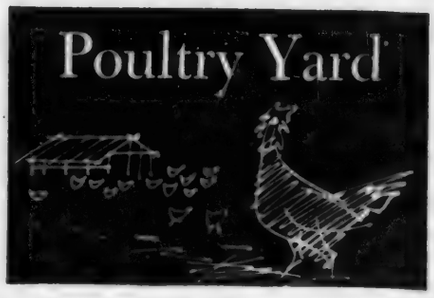
When you re-ring car, truck, or tractor engines, insist on SEALED POWER Kromex Ring Sets, with the protection of solid chrome faces on top and bottom rings! These sets break in fast, control oil immediately, and give more than double the life of ordinary ring sets!

CARE AND FEEDING OF ENGINES is a 24-page illustrated and cross-indexed guide to engine care which is yours free for the asking! Covering many subjects from Air Cleaners to Water Pumps, it could easily save you a lot of time and money. Just address a postal card to Sealed Power Corporation, Dept. F-6, Muskegon, Michigan.

Sealed Power Piston Rings

BEST FOR RE-RING! BEST FOR RE-BORE!

Sealed Power Motor Parts: Rings, Pistons, Pins, Sleeves, Valves, Water Pumps



Poults Without Papas One of the mysteries of life, the animation that causes sperm and egg to begin the cell division which culminates in a new individual, has recently been complicated by the discovery that certain hen turkeys are capable of producing living young without ever having mated. This form of reproduction, called parthenogenesis, has been known to take place among insects and certain cold blooded animals, but it was not until Dr. M. V. Olsen and S. J. Marsden investigated the problem of cell division in eggs believed to be infertile that we got on the track of parthenogenesis in warm blooded animals. Believing that parthenogenetic division was taking place, these scientists isolated a group of Beltsville Small White turkey hens. To insure that they were getting virgin birds, these hens were segregated from their mates at four weeks (so early it requires minor operation to determine the sex of a bird) and kept isolated from males during their laying period.

Since 1952, when this experiment started, eggs have been collected from virgin hens. About 20 per cent of the thousands of eggs which have been incubated and examined have shown some growth. In a few of these eggs the growth has progressed to the point where blood, blood vessels, and other organs of the embryo were developed. In three cases, one in 1954 and two in March of 1956, live birds were hatched. These undersized birds, all of them male, did not have the vitality of normal birds; all died young, the oldest survived for 22 days.

Among the puzzling findings of the scientists was that virgin hens kept in complete isolation laid about half as many parthenogenetic eggs as virgin hens which could see and hear tom turkeys mating with other hens. This suggests that a study of the glandular activity of the female may throw some light on parthenogenesis. Another idea that has been advanced is that the study of the growth of these unfertilized cells could possibly give us an insight into the growth of cancer cells.

New Wheat Poisoning New moist grain undergoes a chemical action which can be poisonous to poultry. Birds affected show a darkened comb and diarrhea. A suggested cure: one pound of epsom salts to five gallons of water for one day. Recovery should be rapid. Danger exists of confusing with blue comb.

YOU CAN BANK ON A HIGHER INCOME
by Cutting Production Costs

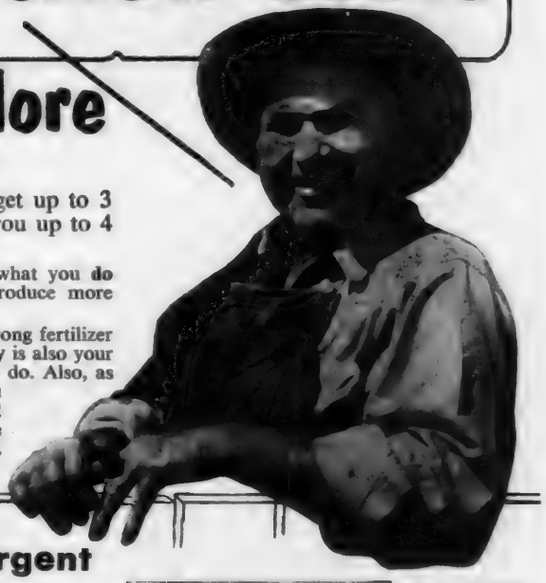
Make Fewer Acres Pay More

TEST YOUR SOIL — DO IT YOURSELF

This nationally recognized, world-renowned Soil Test Kit tells you how to get up to 3 times as much income per acre by increasing yield and cutting costs—paying you up to 4 times as much profit per bushel.

Don't squander money on fertilizer you don't need. These simple 10-minute tests tell what you **do need**—the right fertilizer analysis and correct quantities to make the acres you work produce more than ever before.

Right this season, you'll save several times the cost of your Kit. You'll avoid using the wrong fertilizer on fields where it might not help a bit—or even do harm instead of good. Proper soil fertility is also your best weapon to avoid loss from drought and heat. Your Sudbury Soil Test Kit tells what to do. Also, as soon as a crop is harvested, it tells you how much fertilizer has been removed from the soil. Then you can save time and money by replacing it this fall.



Farmers deLuxe Soil Test Kit

This is the famous **Farmers deLuxe Kit.** Complete with everything for hundreds of tests. More valuable than all your stock and tools! Shows right amounts of nitrogen, phosphate and potash for each field. Also whether lime is needed (pH) and how much. Lifetime welded steel chest with carrying handle. Weighs only 12½ lbs. Easy instructions show needs of 225 different crops. **Big Value, only $29.95.**

Now is an Urgent Time to Test

Prosperous farmers are not content with soil tests just in spring—they test from time to time all season, right where crops are growing. Then missing plant foods are added to protect the higher yield they want.

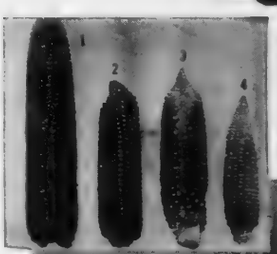
No waiting for reports—you get your answer right away—it's printed on the Sudbury chart. In season, many soil test laboratories are so overworked it may take weeks to reply.

Save Up to $15 an Acre

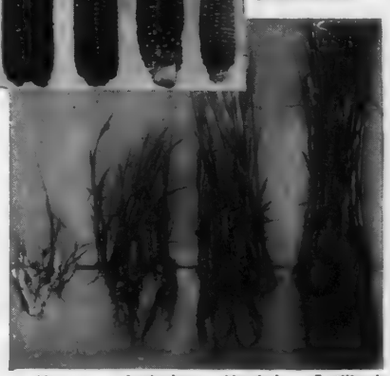
"Guessing" wastes both time and money. A farmer in Illinois "guessed" he needed to spend $500 for lime but soil tests showed he didn't. That $500 paid for all the phosphate he found was badly needed on 65 acres.

A farmer in Kentucky took over land that couldn't grow corn worth picking. After testing his soil and using the right fertilizer he harvested a 90 bushel yield the very first year!

The only way to avoid a lower income is to test the soil and use the right fertilizer. See for yourself—order your Sudbury Soil Test Kit NOW!



Lack of the right fertilizer cuts your profits, as in corn crop at left. Ear 1 was grown in balanced soil. The stunted, deformed ears were from poor soil. (2) lacked nitrogen; (3) needed phosphate; (4) was potash starved.



No Fertilizer | Lacked Phosphate | Needed Potash | Fertilized Correctly

Amazing tests on wheat by a leading ag college showed yield increased ten-fold with proper fertilizer. Note at right vigorous root system as well as heavy top growth. Even when only phosphate or potash was lacking, yield dropped as much as 40%.

Better Crops Guarantee

You Take No Risk—We are so certain you'll get bigger and better crops we'll refund the full purchase price anytime within a year if you don't. That's Sudbury's Daring Guarantee!

Easy Payments if desired

(See order blank below)

Easy As Reading A Thermometer

NO KNOWLEDGE OF CHEMISTRY NEEDED

So simple, anyone can do it. Even your first tests will be accurate and reliable. Ready to use anytime, anywhere, even right out in the field. Takes only 10 minutes, costs less than 10c a test.

500,000 Users Can't Be Wrong!

E.L.M., Ohio—"best purchase I ever made was a Sudbury Soil Test Kit. In our orchard it has paid for itself many times. Knowing what and when to feed your trees means greater profit and savings in fertilizer."

A.F.B., Iowa, increased his bean yield 50% by correcting phosphate and potash deficiencies his Sudbury Kit revealed.

W.L.D., Penna., saved $400 on fertilizer. "The Kit has paid for itself over and over again." That's real satisfaction!

A.D., Indiana, nearly doubled his corn yields after testing his soil. He also gets 30% more wheat and soybeans per acre.

SUDBURY LABORATORY, Box 45C, South Sudbury, Mass.

Hardware, Seed, Grain and Farm Supply Stores—Serve your Customers by Carrying this Essential Aid to Better Farming.

SUDBURY Soil Test Kit

World's Largest Makers of Soil Test Kits

SEND NO MONEY

Order today and we'll mail C.O.D. plus postage. Or send check and we'll pay postage, saving you from $1.91 to $3.55 in postal charges. If not delighted with your Soil Test Kit, you may return it in 10 days for full refund—***Money-Back Guarantee.***

FREE BOOK—If you send cash, we'll also include with our compliments a valuable book on farm management, "Our Land and Its Care."

FREE TRIAL

MAIL COUPON TODAY

SUDBURY LABORATORY, Box 460, South Sudbury, Mass.

Send me the **Farmers deLuxe Sudbury Soil Test Kit** at the special low price marked below:

☐ Enclosed is $29.95; send postpaid; include free book, "Our Land and Its Care."

☐ Send C. O. D. only $29.95 plus postage.

Name .....

R. D. or St. .....

P. O. ..... *Zone* .... *State* .....

☐ Send on Easy-Payment Plan—I'll pay mailman $4.95 plus postage, then 4 monthly payments of $6.75 each.

AFTER ONE SEASON ON D4 TRACKS:

"Gone are the days...

when any tractor was considered suitable. In these days of tight farm prices, it's necessary to trim production costs very closely. In this respect I do twice as much work at ½ the fuel costs with the D4."

... THEODORE G. WOLFE, Mankato, Minn.

Theo. Wolfe and his Cat D4 Tractor handle an 18' tool bar cultivator and 4-section harrow. He says, "I pull larger hitches doing much more work even under adverse conditions."

Pulling tool bar cultivators and harrows, the D4 covers 5 to 6 acres per hour on just 2¼ gallons of diesel fuel, 32 cents' worth in this case.

The gasoline wheel tractors now do mowing, haying, spraying, cultivating corn and beans, etc. And the D4 does the heavy work. It pulls a 5–16" bottom plow. Its CAT* "Swing-Around" Tool Bar carries a bulldozer in front or a wide beam of tools behind.

Think how much you can do with machinery like this! Then, prove it for yourself; ask your Caterpillar Dealer for a demonstration. And ask him for your free copy of "Tires or Tracks" or write Dept. FQ66.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

In 5 to 10 minutes Mr. Wolfe can swing the draft members of the Cat Tool Bar to the front, connect the bulldozer and start moving earth, clearing stumps or trees. He has the machinery to put good conservation measures into practice.

For proof of the baler, examine its bale.

TRADEMARK of a New Holland baler

To build a firm, leaf-filled bale like this—you need speed . . . all-day speed you can depend on to harvest just at the right stage of cure. A New Holland Super "66" has it.

That's why farmers who count on quality hay crops to keep their feed costs down, count on New Holland. They don't worry about breakdowns that could leave a field bleaching in the sun. And they know it will take a sudden, unexpected rain to beat their New Hollands to the windrow.

A New Holland bale tells its story in other ways, too. It's neat and square with no ragged edges. It takes plenty of handling without buckling, stacks and feeds out easy. Facts like these tell more about the knotters, knives and feeding system of a baler than a page of claims.

If you're in the market for a baler, remember, you'll find your best reasons for owning a New Holland *right in the field*. Ask your neighbor.

Then see your New Holland dealer as soon as you can.

Start your new baler off with New Holland Twine, certified by U. S. Testing Co. for strength and length . . . 325-lb. average tensile strength and 9,000-foot length.

NEW HOLLAND "First in Grassland Farming"

New Super "66"
with Metermatic Control

New Holland's Super "66" brings new 2-tone streamlining and new performance to the low-cost baler field. Engine powered or P. T. O. model, it bales up to 9 tons an hour. New *Metermatic* bale control lets you build just the bale you want in weight and size from 12" to 52". All bales are uniform because each bale starts from a "zero" setting.

The New Holland Machine Company, a subsidiary of Sperry Rand Corporation, New Holland, Pennsylvania.

Why FOX *owners get all the corn—tall, short, weedy or down*

Even in muddy fields or borer infested areas where corn may be down, Fox gets it all. No special attachments to buy. Heavy malleable chains with *folding* dogs run all the way down to the points to *clean* fields.

Overloading practically impossible. Large throat opening easily handles heavy corn at normal tractor speeds . . . Fox cylinder type cutting mechanism insures positive, clean shearing cut . . . makes better ensilage . . . 20 lengths of cut available.

Fox safety features prevent damage to the machines from stones or other hard objects entering the knives . . . knives held in rigid alignment by one-piece welded steel frame . . . field sharpening is quick and simple.

Fox harvests ALL *forage crops.* One man, without tools, can change to pick-up, mower bar or corn unit in 10 minutes. Ask your nearest dealer to show you the Fox . . . designed for years of trouble-free service.

NEW—Two Row Corn Harvesting Unit . . . to give you added silage making capacity with only half the field travel.

FOX RIVER TRACTOR CO.
The Pioneer of Modern Forage Harvesting Dept. 566
13125 N. Rankin St., APPLETON, WISCONSIN

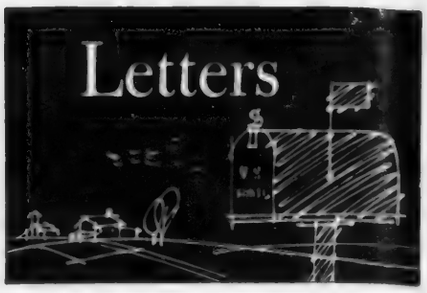
FREE—"NEW WAYS TO MAKE MORE PROFIT FROM FORAGE"—an information packed manual filled with practical experiences of men who have made forage crops bring in extra dollars. Send this coupon for your FREE copy.

FOX RIVER TRACTOR CO., 13125 N. Rankin, Appleton, Wisconsin
Send me, without charge, a copy of "NEW WAYS TO MAKE MORE PROFIT FROM FORAGE" and your new 1956 Fox Forage Harvester Catalog.

NAME (Please print)_____

ADDRESS_____

POST OFFICE_____ STATE_____



Reviewing the Case

Sirs:

Reading the feature, "The Case for the Farmer" in the Spring issue, prompts me to write you that there is another way of using most of the farm surplus. This is true of all grains, rice and potatoes.

When World War II broke out, you will remember that tires were restricted on autos. Gas was rationed by coupons. The writer had, at that time, just left the Dept. Of Agriculture, and was in business in Minnesota. Congress, in the winter of '41 worked on a bill to convert farm materials into alcohol. As a war measure it was done. The alcohol was used in making explosives and synthetic rubber. The hearings in the House and Senate showed that farm products converted by these means would benefit the entire nation. The gallons to be obtained from different crops were established. This is a matter of record in the Department of Agriculture in Washington.

Two months ago, a friend here in Denver was in Washington, and asked the Department about it. They know it can be done but the oil interests object.

The Colorado Legislature sent to Washington in February, this year, passed by both houses and signed by the Governor, a request, that the matter be investigated again. I was surprised that this action was taken in Colorado because this is a big oil producing state.

Senator Guerney, when he was alive, in South Dakota produced gasoline and used 10 percent alcohol and 90 percent gasoline. He sold it in all his WNAX gas stations. While up there for years, I used it in cars and trucks without any engine changes. It worked better than gas.

I am calling this method to your attention today, just as Washington is trying to find a solution of farm products. I suggest you have someone on your staff read the records now in Washington, and I am sure you will be surprised at what can be done, both with surpluses and advancing farm income.

E. K. Jenkins

Denver, Colorado

Sirs:

I realize that you put much research, time and thought into your editions; however, please be assured that these efforts are well rewarded since the QUARTERLY stands above all other farm magazines in a comparative ratio of the national debt versus my income.

Will agree with your article "Case for the Farmer." I, too, feel that the largest share of the problem lies in the *education* of Mr. Farmer right down the road; however, this, too, is almost impossible I fear.

Clint Wilkins

Linden, Indiana

Sirs:

I write this to congratulate you on your very excellent article in the Spring issue concerning the farm situation.

I am one of those who believe that controls are necessary if we are to avoid much greater evils. We must consider the immediate effects

(*Continued on page* 22)

THEY'RE ADDING INCHES
TO EVERY EAR OF CORN YOU FEED

You've seen what science, through hybridizing, did to boost corn yield.

Now another branch of science, coming to the farm in a feed bag, helps you get a greater yield of meat, milk and eggs from every ear of corn you feed.

For corn, good as it is, lacks many of the 30 or more health- and growth-promoting elements needed for you to get the most possible production out of your birds and animals.

Pfizer scientists, for example, found that when 40 grams of Terramycin® (about a heaping tablespoonful) was added to a *ton* of feed, pigs grew up to 15% faster. And just this year they found a new growth-promoting ingredient that, when added to a good corn-soy ration would give still another 10% faster growth.

Since this new substance was discovered at the Pfizer Agricultural Research and Development Farm in Vigo County, Indiana, it was called "The Vigo Factor" or trademarked "Vigofac" for short.

These benefits of scientific research are brought to you by America's progressive feed companies in complete feeds and in concentrates, which, when added to your home-grown grains, add "inches of feed value" to every ear of corn.

What next from Pfizer—and your feed man? Whatever it is, you can bet your boots it will help to increase your income and shorten your feeding time still further.

Science comes to the farm in a feed bag.

Pfizer

Pfizer Agricultural Research and Development Department

Users tell why...

BEST GRAIN SAVER EVER!

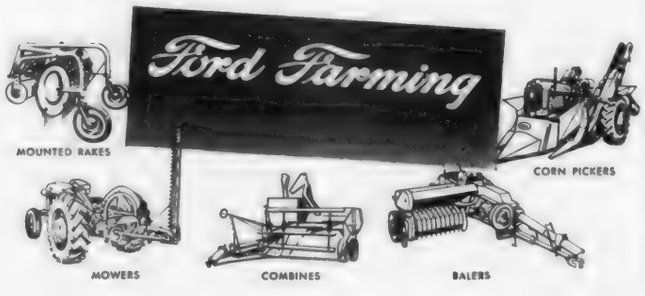
Less grain "rides over" in a Ford Combine with its 4-section walker-type straw rack. Its toss-and-turn action prevents grain from "riding out." Only combine in its class with this advantage.

Quick-change cylinder speed. You don't even need a wrench to change the cylinder speed—just turn a knob. You can quickly adjust threshing action to crop conditions.

FORD Combine

No fancy talk here. Just plain facts about the grain-saving features of the Ford Combine that farmers themselves have found outstanding. But there's much more.

That's why it will pay you to get the complete inside story about the Ford Combine from your nearby Ford Tractor and Implement Dealer. Ask him, too, about the complete Ford Harvesting Machinery line. Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.



Bigger cylinder reduces slow-downs. The cylinder on a Ford Combine has more "throw" because of its big diameter—handles tough, heavy straw and down crops where other combines often choke down.

Gets more of the crop into the combine. You can cut lower and get more down grain. The header floats easily over rough ground. Gentle-slope header prevents bunching on the draper. Faster cutting sickle clips cleaner. Ground-driven reel shatters less grain.

Cleans grain better, to sell at a higher grade. With a smoother spread of material over the chaffer, there are fewer thin spots or blow holes to retard cleaning. Large sieve area and better control of wind blast help put cleaner grain in the bin.

With General Electric Irrigation Motors . . .

"Pre-season" irrigation produces more cotton in dry Southwest

"IRRIGATION DURING THE 'OFF SEASON' provides better seed germination and plant rooting during the growing season," says Bill Killip—irrigation specialist for Arizona's Goodyear Farms. "During the cotton season we irrigate about seven times. This system helps us get close to three bales per acre off our cotton land."

Herb Ensign, of Ensign and Kempson, Layne and Bowler Pump Co. dealer in Phoenix, designs Goodyear Farms' irrigation pump installations. For the past five years General Electric Irrigation Motors have been used almost exclusively on these pumps.

Fred Chambers, Goodyear's chief electrician, claims: "I have to keep our irrigation motors in good operating condition at all times. This new G-E motor is easy to inspect, lubricate and maintain, and is tops with me." G-E motors require very little maintenance, and the new Vistamatic sight gage lets you check oil level at a glance. The cast-iron motors are rugged and can take the weather. They can save you time, money and labor.

Make sure you get all the benefits of modern irrigation pumping. Insist on General Electric motors when you buy an irrigation system from your local dealer. 870-2

Progress Is Our Most Important Product

GENERAL ELECTRIC

P.O. Box 1064, Schenectady 5, N. Y.
Medium Induction Motor Department
General Electric Co.

Please send me free bulletin GEA-6280 giving more information on the advantages of G-E irrigation motors.

Name_____

Address_____

City and State_____

My Pump Dealer Is_____

Address_____

Wheels on the Farm

Few products today take more continual punishment than wheels on the farm. And few products have been made so dependable.

The building of wheels of *proven dependability* has been the business of Kelsey-Hayes since the day of the team-drawn dray. Today, practically everything that rolls on the farm—from tractors, trucks and trailers to the family car—rolls on wheels by Kelsey-Hayes. Kelsey-Hayes Wheel Company, Detroit 32, Michigan.

KELSEY-HAYES

A Major Supplier to the Automotive, Aviation and Agricultural Industries

TEN PLANTS / Detroit and Jackson, Michigan; McKeesport, Pa.; Los Angeles, Calif.; Windsor, Ontario, Canada • Davenport, Iowa (French & Hecht Farm Implement and Wheel Division) • Springfield, Ohio (SPECO Aviation, Electronics and Machine Tool Division)

Help yourself out of the cost/price squeeze!

"Believe me, I know what C&L bins can do! I got 10% more grain, no field loss, no spoilage, and it all tested out #1 quality."
—ED SPEIDEL, Hamilton County, Ind.

FREE!

Valuable C&L Grain Marketing Digest for 1956! Here's almost everything you need to know about storing grain, marketing it, *making money from it*. So new it's still on the printing presses—so practical you'll want to hang it on the wall and consult it often. In practical 22" x 30" size. Send coupon or write—today!

on-the-farm grain storage pays for itself... increases profits!

Why be satisfied by "taking what you can get" when you sell grain at harvest time? It's easy, safe, profitable to store grain in a C&L Buckeye Bin . . . and sell when grain prices go up. You can make enough extra income to pay for your bin in just a season or two. And from then on, your added earnings from modern C&L grain storage are practically all clear profit.

Here's something else! C&L steel perforated floors and portable blowers let you safely harvest early—even with high moisture content—yet help you improve grain quality because you can eliminate dirt, broken grain, storm and insect damage, and eliminate "shatter-loss" from dry, brittle grain. You'll have 100% even grain drying, no moisture pockets or condensation damage.

Send right away for free information on C&L Buckeye grain bins and optional C&L perforated flooring and drying equipment. They're easy to own, easy to erect or install—surprisingly low in cost. Mail coupon today!

INCREASE INCOME $1,000 WITH A C&L SILVER SHIELD SILO!

Proper silage can add up to $1,000 and even more to your farming operation in a single year—if you do it right, with a C&L Silver Shield Silo! Advanced design Silver Shield Silos are ideal for grass and other silage because they're completely airtight, low in maintenance, highest in quality performance through the years. Easily financed, too—so act now.

Send coupon *today*, while there's still time to make extra profits this year.

This actual record shows what the right silo can do.

Before grass silage		
TOTAL SALES:		$21,978.00
Feed purchased	$3,811.00	
Other expenses	7,550.00	
TOTAL COST		11,361.00
Gross profit		$10,617.00
Less steers purchased		4,874.00
TOTAL NET PROFIT		$ 5,743.00
After grass silage (first cuttings)		
TOTAL SALES		$22,744.00
Feed purchased	$ 487.00	
Other expenses	6,843.00	
TOTAL COST		7,330.00
Gross profit		$15,414.00
Less steers purchased		5,003.00
TOTAL NET PROFIT		$10,411.00
EXTRA profit as compared to profit before grass silage farming		$4,668.00

CLAYTON & LAMBERT
1015 Lamneck St., Middletown, Ohio

Please rush me the free information I have checked below:

- ☐ 1956 Grain Storage Chart
- ☐ "Grass Silage Pays Off" booklet
- ☐ Information on C&L product listed here _____ fill in name of product.

NAME _____

ADDRESS _____

TOWN _____ STATE _____

Clayton & Lambert

1015 LAMNECK ST. • MIDDLETOWN, OHIO

C&L Silver Shield Silos • C&L Silver Shield and Buckeye Bins and Cribs • C&L Silver Shield Bulk Storage Bins C&L Silver Shield Commercial Bins—also C&L Alumilux and Hoffman Water Heaters, C&L Blow Torches.

MAKERS OF AMERICA'S MOST COMPLETE LINE OF FARM STORAGE BUILDINGS

USE PLASTIC PIPE... MAKE SURE IT'S YARDLEY CLEARSTREAM
MORE WATER MEANS MORE MILK!
WE CAN LAY IT OURSELVES. IT'S PRESSURATED FOR OUR WATER SYSTEM!
YARDLEY-PIPED WATER WILL KEEP OUR MILKHOUSE SPIC AND SPAN!
HOT DOG! NO MORE WATER CARRYING! NOW WE'LL HAVE IT IN ALL OUR OUTBUILDINGS!
I'M SURE DELIVERING YARDLEY PIPE ALL OVER THE COUNTY!
HENRY, LET'S INSTALL RUST-PROOF PLASTIC PIPE ON OUR JET PUMP
WE HAD OUR YARDLEY PIPE LAID BY LUNCHTIME. DO MY CHORES IN HALF THE TIME NOW.

YARDLEY *ClearStream*® *Plastic Pipe*

PressuRated for Farm Water Systems

Install that new water system right now for more profitable operation . . . for better farm living. With ClearStream Pipe you easily supply all the water you need to your home, hen houses, dairy buildings, stock troughs and every other location to help improve farm production.

Yardley *ClearStream* PressuRated Plastic Pipe was developed for farm water systems . . . the first fully pressure-rated pipe made for this use.

Yardley ClearStream Pipe is made from DuPont Alathon Virgin Resin . . . an improved pipe material recently perfected. You get higher permanent strength and uniform toughness . . . top resistance to weathering . . . flexible at temperatures to minus 70 degrees F. . . . ⅛th the weight of steel pipe.

Yardley ClearStream comes in 75-lb., 100-lb. and 125-lb. working pressures in all six sizes from ½ inch to 2 inches. Every length is guaranteed to meet rated pressure requirements with a substantial safety factor. Easily and quickly installed with a few simple tools. Long lengths and flexibility reduce the number of fittings . . . and once it's in, it's there to stay. It never rots, rusts or corrodes. Available through your dealer in lengths up to 400 feet. Look for the pressure rating and the ClearStream name stamped on every length and package. For service lines or pump pipe insist on genuine ClearStream. Send for literature.

Look for this Identification on every package and reel.

M-21 Twin-du-it for Jet Pumps

M-21 Sub-du-it for Submersible Pumps

YARDLEY PLASTICS CO., 142 Parsons Ave., Columbus 15, Ohio

In Canada: DAYMOND CO., LTD., Chatham, Ontario — Export Sales: F. & J. MEYER, 115 Broad St., New York 4, U.S.A.

LETTERS

(*Continued from page* 16)

of legislation and, more important, the effects 25 years from now.

Larkin Hundley

Monticello, Florida

Dissenting Opinions

Sirs:

. . . The trouble isn't that we farmers don't know how to farm; and we don't need your city guys' ways either. All we need is a square and honest deal and that we can't get under the Republicans which most of you magazine men are.

If we were as well protected as you paper guys and had short hours we wouldn't know what to do with ourselves. So instead of trying to say any magazine will help us make money, just vote Democratic.

Mrs. Alvin Vollmers

Wheaton, Minnesota

Sirs:

I could say plenty about government interference in farming, but I might get too rough. I have been fairly successful now as well as in the past. All government, state and county so-called farm and farming experts get the same instructions: "I was making money before you were born. My observation has been that about all you fellows know is what you read out of a book, someone told you, or you looked out the window and saw. Now just get to hell down the road and leave me alone."

E. W. Riley

Springville, Alabama

Sirs:

. . . After spending my entire life farming and reading quite a few farm magazines, I have in all sincerity arrived at the conclusion it will take a lot more than farm publications to lift us out of this situation. I might also add that in my opinion after reading a number of so-called farm periodicals, I feel that in most instances the quality of fearless journalism is sadly lacking.

I would like to say the above remarks are not intended to belittle you in any way. I do feel that there is a tremendous amount of good that could be done without too much trouble to give the farmer somewhere near a fair deal and in so doing make a lot better U.S.A.

Sam Deal

Wheaton, Minnesota

Misplaced Monster

Sirs:

I was interested in a copy of your Spring QUARTERLY and in the story of the Cardiff Monster. In the story the statement is made that in 1868, Mr. George Hull "turned up at the St. Charles Hotel in Dodge City with a friend" and then the story continues about obtaining a block of gypsum.

There is gypsum being mined about 80 miles east of Dodge City. We do not know if that deposit was known in 1868. We are, however, quite doubtful about Dodge City being the location, because Dodge City was not founded until 1872.

We are interested, of course, if this is an historical fact about Dodge City, but suspect that the writer means Fort Dodge, Iowa.

George B. Weeks,
Manager

Dodge City Chamber of Commerce
Dodge City, Kansas

Reader Weeks is probably correct. In our research, Dodge City was always mentioned as the place and if a mistake was made it was made years ago and has come down to us that way.

(*Continued on page* 144)

Normal rainfall is NOT enough!

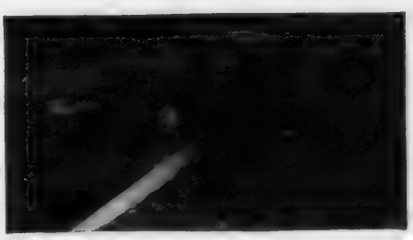
for top yields, MANAGE MOISTURE with GORMAN-RUPP IRRIGATION PUMPS

The big question about rainfall is not whether the year's total is normal, but whether enough falls at the right time. This rarely happens.

Even with normal rainfall, sprinkler irrigation makes sense. It makes even more sense to make sure your system is the best with a Gorman-Rupp Irrigation Pump, backed by the combined experience of more satisfied users than any other make.

Be practical about irrigation. Get an engineered plan. No obligation. Write Gorman-Rupp today.

26 MODELS in centrifugal pumps for every irrigation requirement. Pump-and-engine packaged units with automatic check valve with level control, shaft seal under suction, large drum-type fuel tank — operational safety controls standard. Engines: air-cooled, radiator, heat exchanger. Gasoline, LP, natural gas, kerosene and diesel. Also PTO driven pumps.



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305 Bowman St., Mansfield, Ohio

Gentlemen: I want an Engineered Irrigation Plan developed for my farm. Have your irrigation engineer contact me at no cost or obligation to me.

Name_____

Address_____ P. O._____ State_____

Irrigation Acreage Estimate_____ Acres

☐ Lake ☐ River ☐ Ditch ☐ Pond ☐ Well

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UPDATE YOUR TRACTOR POWER

READ WHAT USERS WRITE ABOUT

M & W Live-POW'R PTO

1 Since I put Live-POW'R on my Farmall M I can chop three loads of alfalfa in the time it used to take to chop two.

2 My baler doesn't slug up anymore. We go right through the heaviest swaths.

3 With M&W Live-POW'R on our tractor we can pick up down corn without leaving ears in the field.

4 I have an "M" with an M&W Live-POW'R clutch and a new International 400. I can use my "M" with Live-POW'R without wearing my clutch out and without tiring footwork.

5 I didn't need auxiliary engines on my new pto-driven baler and combine. I figure I saved about $1000.

6 Live-POW'R does away with about half the normal shifting, reshifting and foot clutching on my Farmall H.

7 I cultivate closer to the end of rows and still have full pump power to lift my cultivator.

8 We put two swaths of alfalfa brome together. Cuts our hay chopping time by about a third.

9 I do a lot of grinding and my M&W Live-POW'R doesn't weaken the pto shaft. The shaft will take the full horsepower of the motor.

10 My M&W Live-POW'R clears all my mounted equipment. I wouldn't be without it. It has all the advantages of a separate hand clutch.

M&W 2-WAY, 1-WAY LIVE HYDRAULIC SYSTEMS . . . INSTANT FINGERTIP CONTROL OF ALL EQUIPMENT

For fast, high pressure control independent of transmission clutch and the pto ask your local tractor dealer to install an M&W Live Hydraulic System. Gives you immediate power, continuous one-way or two-way operation, greater capacity. Installations available for Farmall, Case, Allis Chalmers, Minneapolis-Moline and Oliver Tractors.

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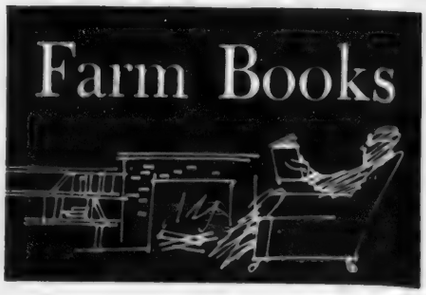
Farm Books



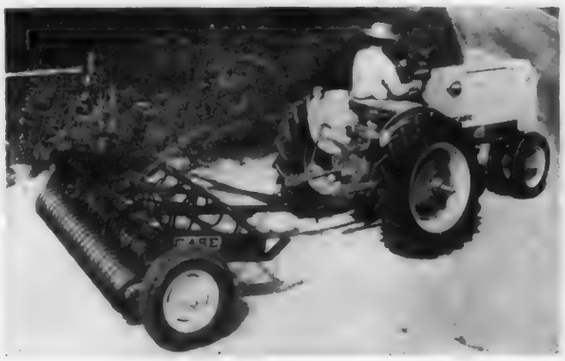
***Amateur Beekeeping**, by Edward L. Sechrist. The Devin-Adair Company, New York, $3.50.*

If it were not for the stings involved, bee culture would probably be as popular a hobby as flower gardening. For the bee is one of nature's most interesting creatures, a prodigious worker with the instinct for solving the very toughest problems. But those stings are a formidable barrier for most folks, so bee raising remains the pastime and livelihood of but a relatively few individuals.

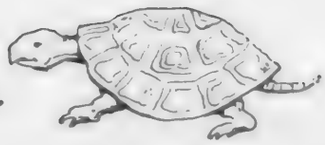
Even among those few who are able to conquer their fear of the stinger there are those who invariably get off on the wrong foot with the bees because they follow too literally the old recipe for rabbit hash —first catch the rabbit. They have an idea that all they have to do is get the bees, put them in a box and proceed to collect the honey. Actually, if that were all there is to it, bee-keeping would lose most of its devotees. It is the challenge of learning the ways of these amazing little workers and directing them to man's purpose that supplies the chief attraction of the art.

Amateur Beekeeping will give the beginner plenty to think about before he catches or buys his first bee. Bee-keeper Sechrist takes nothing for granted. He assumes that his reader knows nothing about the care and handling of honey-makers and he directs his words primarily to the individual who would like to start out with no more than one hive of bees. The warning is first given that there are many and varied systems for handling bees, but that the beginner can expect success only if he follows but one system at a time. The hive is dismantled and described in detail, the few essential tools of the business are described and instructions given for their use and there is a detailed section on clothes for the well dressed bee-keeper. This is no mere fashion note. The man who knows won't monkey around the hive in store-fresh blue denim. Bees don't like the odor and when they run into objectionable odors they begin to sting. Likewise, black is a poor color to wear when working the hive; white is much less likely to agitate the bees. Bib overalls with straps are never acceptable wear for a honey gathering. The straps and the bib provide wonderful spots under which the bees can crawl and inflict painful reprisals.

(*Continued on page* 116)



Slow



Moving along as slowly as ¾ of a mile per hour isn't the whole story. Even at this turtle's pace you will marvel at the smoothness and steadiness with which the new Case "300" barely creeps. Actually, you have an amazing choice of three creeper gears for working at speeds up to 2½ MPH . . . giving you greater accuracy and versatility for jobs like spraying or transplanting.

Swift

Yes—the new Case "300" has all the speed of a rabbit with transport gears up to 20 MPH . . . saving you minutes that add up to hours in traveling from farmstead to field, going to town with loaded wagon, moving mounted or wheeled equipment. Whether you want to creep or roll right along, the revolutionary new 12-speed Case Tripl-Range Transmission gives you operating performance never before achieved in any farm tractor.

New 3-Plow, 4-Row

CASE "300" 12 SPEEDS

You'll be surprised at the man-hours you save . . . and fuel, too . . . when you have 12 speeds forward and three reverse to make full use of engine power at every load, light or heavy. Yet, you also maintain proper PTO speed regardless of rate of ground travel.

The new 3-plow, 4-row Case "300" is alive with other advantages . . . Powr-Torq engines for gasoline, LP-gas, distillate or diesel . . . Safety-Lock hydraulics with duo-control . . . "Tell-Easy" instrument panel with 8 separate indicators for keeping power in balance with job requirements . . . 3-point Eagle Hitch for hooking up without leaving tractor seat . . . plus a host of personalized comforts and conveniences.

$583.50* DOWN
f.o.b. factory

And—after you've talked with your Case dealer about the flexible Case Time Payment Plan, you'll see why you shouldn't wait to order a Case "300" now . . . start enjoying its money-saving benefits . . . pay the balance on a schedule that avoids hardship or strain over two or three years.

*Utility Model with gasoline engine and 12-speed transmission

Case builds a full line of modern tractors and farm machinery. For catalogs, check below or write in margin others you want. J. I. Case Co., Dept. F-906, Racine, Wis.

☐ 3-Plow Case "300" ☐ 5-Plow Case "500"
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Acres you farm?_____ Are you a student?_____

Name _____

Address _____

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6 Ways To Farm Better

(1) You farm better with -SIOUX- steel buildings to protect your machinery and livestock. Costs less because exclusive trussless, sturdy, rib construction requires no framework or concrete foundation.

(2) You farm better with -SIOUX- steel grain bins to protect you from low harvest-time markets. Most easily erected because of six ply ribs.

(3) You farm better with the most wanted corn crib in America, -SIOUX- AIR-DRI, that lets you pick your corn two to four weeks earlier and avoid unnecessary field losses.

(4) You farm better with rugged -SIOUX- Giant Deluxe all-steel hog feeders to keep feed before your hogs 24 hours a day so hogs get to market sooner. The 14-gauge lids are stronger . . . give one-fourth longer service.

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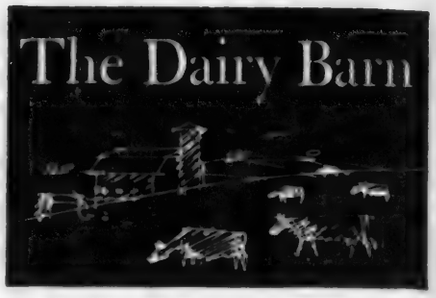


Pound Barrier Broken

Three pounds of dry matter per 100 pounds body weight of the animal has long been regarded as the maximum amount of harvested forage a dairy cow can consume in a day. This has always been cited as one of the limiting factors in any attempt to produce milk on an all roughage or a high roughage ration. But there are more and more fellows running around these days doing things that just can't be done, fellows with that "Let's see what'll happen" attitude. One of the most rabid of the fraternity is one Marshall McCullough, a slight, sandy haired, young staff member of the Georgia Experiment Station.

Nothing seems to delight McCullough more than to see how much hay and silage he can shove into a cow. Recently he was working on a project at the station, in which a group of Guernsey cows were being fed the assumed limit of 3 pounds of dry matter per 100 pounds body weight. They weren't having a bit of trouble cleaning it up; trouble was they ate all the feed in 12 hours then had nothing to do for the rest of the day but stand around.

Such a waste of time irked McCullough, who determined to see how much forage the cows could handle at a barnyard smorgasbord. They were divided into two groups, one group given corn silage free choice and the other getting all the hay it could handle. The result: the pound limit was smashed.

The cows in both groups weighed an average of 930 pounds. Those getting silage free choice consumed 80 pounds of silage and 15 pounds of hay per day for an intake of 37.5 pounds of dry matter which tallied 4.03 pounds per 100 pounds body weight.

The cows on the free choice hay ate 50 pounds of silage and 28 pounds of hay, an intake of 40.2 pounds of dry matter or 4.30 pounds per 100 pounds body weight.

The cows getting silage free choice consumed 22 pounds of TDN (total digestible nutrients) per day and 2.0 pounds of digestible protein. Those on the free choice hay ration consumed 23 pounds of TDN and 2.4 pounds of digestible protein. This TDN intake, according to all accepted standards, is sufficient for the cow's maintenance and the production of more than 40 pounds of milk per day; however, the protein intake would have

(*Continued on page* 149)

POWER COMMAND

IT'S HERE IN THE NEW ADVANCED FERGUSON SYSTEM 40

Power Command is the integration of the advanced Ferguson System with other Ferguson firsts to give you complete and instant command over tractor and implement operation.

From your command post in the comfortable Foam-Float seat, with your finger tips on the new Quadramatic Control, you direct operations: raise and lower implements; select draft and maintain working depth; adjust the hydraulic system's speed of response; and hold implements in any position.

Contributing to your command over every farm job are other famous Ferguson 4-Way Work Control features: Variable-Drive PTO for versatile, synchronized power; "2-Stage" Clutching for one-pedal control of both transmission and live PTO; and Dual-Range Transmission for peak efficiency in every speed range.

Now, the one tractor that dared to be different years ago, still leads the way with five new models, every one of them with the famous Ferguson System: the new "40"; 3 "Hi-40" models with convertible front-wheel assemblies . . . and a better than ever Ferguson "35", proved on tens of thousands of farms. *Ferguson*, Racine, Wisconsin.

NEW POWER STEERING
Even more valuable on your tractor than on your car. (Factory installed option.)

HEAVIER, LONGER, MID-MOUNT, TOO!
New Mid-Mounted Cultivators available for the Ferguson "40" and "Hi-40" models.

NEW, 12-VOLT ELECTRICAL SYSTEM
Faster, surer cold weather starts . . . hotter spark for better performance.

FREE VACATION TRAVEL CONTEST!
It's easy. Nothing to buy or write. See your Ferguson Dealer for entry blank.

B.F.Goodrich

"Power-Grip tractor tires give better traction,"

Midwest farmer reports

***FREE!* On-the-farm tire inspection. Call your nearby B. F. Goodrich retailer**

Stop tire trouble before it starts with a FREE B. F. Goodrich On-the-Farm Tire Inspection by your Tire Service Man. He'll inspect *all* your tires, give you unbiased advice that will cut your tire costs and save you work time. Here's what he'll do:

1. Check all your tires and recommend proper air pressures.
2. Point out tires that should be repaired or replaced.
3. Recommend proper liquid weighting.
4. Check steel-wheeled equipment to see if savings can be made by switching to rubber.
5. Advise you on possible savings to be made by retreading worn but serviceable tires.

EARL MCDOWELL farms 160 acres near Luverne, Minn. Here he uses his tractor to pull a forage harvester that chops up silage and blows it into a truck. The tractor rolls on B. F. Goodrich Power-Grip tires because, says McDowell, "they give me better traction and less slippage." Because they give better traction, McDowell says he gets his work done faster.

B. F. Goodrich builds the Power-Grip tire big and wide. No other tire is wider—and size for size, no tire has more cleats. Power-Grip tractor tires give you more traction both in reverse and forward:

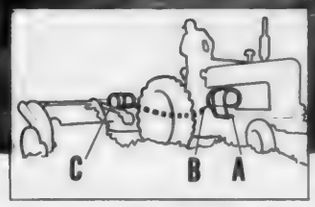
And the husky, square-cut cleats resist slippage, dig deeper into the soil to give you greater drawbar-pull.

Highest trade-ins of the year

Now is the time to get a set of Power-Grip tires. Your nearby B. F. Goodrich retailer is offering the highest trade-ins of the year for your worn tires. You'll save money by buying *now*. See your nearby B. F. Goodrich retailer today and ask about his special crop payment plan. *B. F. Goodrich Company Tire & Equipment Division, Akron 18, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

Your B. F. Goodrich retailer is listed under Tires in the Yellow Pages of your phone book



G-E GENERATOR (A) FURNISHES ELECTRIC POWER THROUGH SINGLE CABLE (B) FOR BALER MOTOR (C)

No PTO Shaft or Engine! Electricity Drives This Baler

Electrically powered farm machines are now a reality. International Harvester tractors equipped with Electrall*—General Electric's mobile power generator—provide a whole new source of portable electric power for the farm. They drive power-driven equipment . . . keep electrical household and farm equipment in operation during high-line outages . . . and power portable tools away from the farmstead. This new power source can help you now:

SAVES YOU MANPOWER because electrified equipment can do many jobs faster and safer. On the market is an electric motor-driven hay baler powered by the tractor-mounted G-E generator. It drives the baler smoothly at full capacity . . . saves hookup and maintenance time (the electric motor requires no fuel and little or no maintenance for as long as ten years). A single cable connects the baler to the G-E generator. Other power-driven farm equipment will soon be built to take advantage of portable electric power.

SAVES YOU MONEY because it gives you an emergency power supply, always at hand to keep milkers, coolers, freezers, and other vital equipment in operation. If regular power should fail, simply plug in your tractor-mounted generator to a "double-throw" switch installed at your house or barn.

SAVES YOU TIME because it acts as a portable "wall-plug," provides you with power anywhere. Portable electric tools can be taken out into the fields to make equipment repairs on the spot. Time-consuming jobs, such as digging post holes, sawing logs, trimming hedges, can be done with faster, more economical electric power.

FIND OUT MORE about how you can benefit from this big-capacity portable electric power source. A tractor without a built-in source of electricity is yesterday's design. Ask your farm equipment dealer now to demonstrate the advantages of tractor-mounted portable electricity. 572-1

*International Harvester Trade-mark

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EMERGENCY POWER is always at hand to keep vital farm equipment in operation.
Parkers' Dairy, Granville, N. Y.

PORTABLE POWER for an electrical "farm hand," like this welder, is available right in the fields.

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MEDIUM INDUCTION MOTOR DEPARTMENT
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Please send me a copy of your booklet, "Electricity on Wheels" (GEA-6400), showing the many uses of the mobile power generator. My farm equipment dealer is

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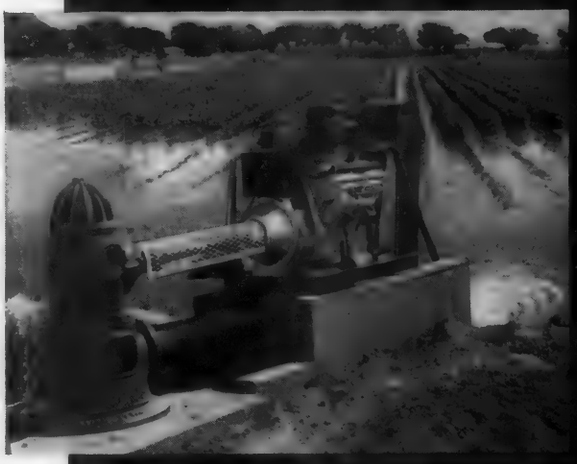
CHRYSLER POWER GREAT



for Centrifugal or Turbine Pump, Sprinkler or Ditch Irrigation

North, South, East or West—wherever you go you find Chrysler Industrial Engines supplying power for irrigation. Whether pumping surface or ground water, burning gasoline, natural or L-P gas fuels, Chrysler Industrial Engines deliver maximum horsepower on continuous schedules.

That's because these are *industrial engines*—cool-running, heavy-duty-equipped, high-speed engines. Your pump dealer will recommend a Chrysler Engine to fit your system. See him or a Chrysler Industrial Engine dealer. For details on all Chrysler Engines, write: ***Dept. 226, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER
INDUSTRIAL ENGINES

there's an Allis-Chalmers to fit YOUR CROPS

1

. . . YOUR ACRES

. . . AND YOU!

From plump-podded soybeans in short rows, to thick-clustered sorghum heads as far as the eye can see, there's now an Allis-Chalmers harvester for any combine crop . . . any acreage . . . anywhere.

You can have your choice of a machine bearing the greatest name in harvesting . . . in any of 3 combine fields.

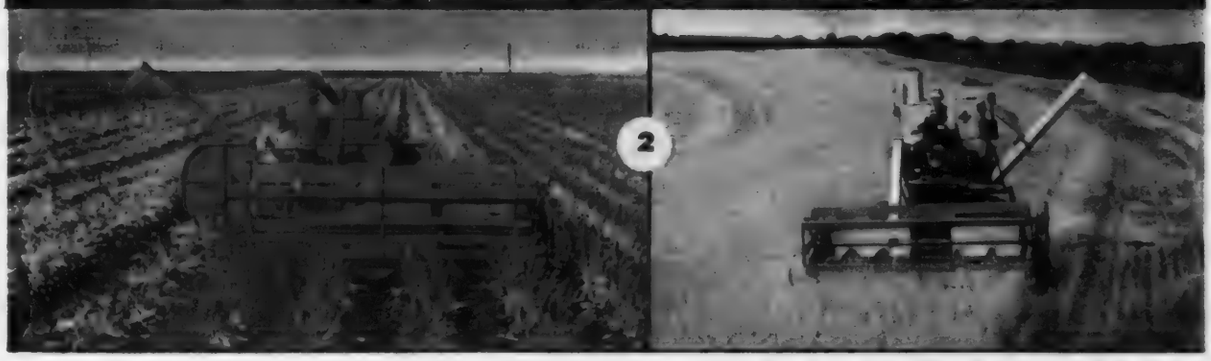
Years of original, trail-blazing engineering have perfected an Allis-Chalmers home harvest for over 100 crops—with control entirely in your hands.

When you see the bushels heap high . . . harvested cleanly with perfect timing . . . you'll know the satisfaction that comes with your ownership of an Allis-Chalmers combine.

Ask your dealer—it can come true for you this year.

ALLIS-CHALMERS, FARM EQUIPMENT DIVISION
MILWAUKEE 1, WISCONSIN

LEADERS in all 3 combine fields



2

1 "Big-Bin" ALL-CROP Harvester
6-ft. Model 66 for more than 100 crops, including grain, beans, sorghums, grass and legume seed, peanuts, etc.

2 Medium-size SELF-PROPELLED
9-ft. and 12-ft. Model 100 ALL-CROP Harvester
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3

ALL-CROP Harvesters . . . GLEANER-BALDWIN Combines

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Oasis Farmer

While world politics swirl about him the Arab farmer scratches out a scanty living on his desert farm

By R. J. McGinnis

This spot in the desert is holy ground. A Marabout, a saint, died here and is buried in the little whitewashed tomb near the chapel. Here the nomad can stop and pray.

This Arab plowman is using a steel plow, a gift from the U. S. under Point Four. It does a better job of turning the soil than his old primitive wooden implement, but many farmers believe scratching out furrows is better practice in desert farming; there is less erosion and seeds aren't covered too deep.

In public the beauty of the face and figure of the Arab woman is hidden under the folds of her barracan. Only in her home and among members of her family does she uncover her charms.

WHO KNOWS where Khalifa Suei's mattress came from? What its origins or its journeys, and whether Infidel or Believer had bedded on it before it came into his hands, Khalifa cared little. Scavenging on the fringe of Rommel's retreating army, Khalifa had found it in the bottom of a wadi. He loaded it on his camel with other debris of battle and brought it to his mud hut in the oasis.

He and his friends sit on it through long afternoons, drinking tea and munching dates and peanuts; his goats and sheep like it too, and occasionally he has to boot out some livestock before he can bed himself down for the night. The desert sands have sifted in around it and it is covered with countless stains, so that only faint traces of its former splendor remain: but it has been durable and must at one time have been a thing of beauty. It is regarded as a great luxury and Khalifa is known far and wide as the man with the Infidel mattress. Without a doubt it is the only mattress in all the desert region which stretches from the narrow oasis of Tripoli southward endlessly across the Jebel and the great Sahara to the Sudan.

Khalifa Suei is a Libyan farmer. He is an Arab, part nomad and part settled, depending on the season and the rains. His skin is dark, burned by the desert sun and etched by the sand and wind; he is thin and wiry. He is a self-reliant, fears no man, and has the solemn dignity of one who walks with God.

Like many of the tribesmen of North Africa, he has a home base in an oasis. Here he has a mud hut and five hectares of land; here he spends the dry season, the summers and the early fall. But when the rains come and the grass grows in the desert pastures, he becomes a nomad. Packing his black goat hair tent and his plow on his camel, he sets out for the tribal pastures in the sheltered valleys of the Jebel mountains, a half hundred miles to the south. His wife and children trail after him, driving the sheep and goats and the family cow. In the narrow valleys and wadis, where the rains have brought sufficient moisture for a crop, he plants scattered patches of barley and wheat. These patches may be miles apart. He has traditional title to these fields, but the pasture is owned by the tribe, and first come first served. His wife and children shepherd the flocks while he and his grown sons do the planting. After the planting he returns to the oasis with his wife and the small children, leaving his sons to herd the flocks during the season of grass.

Following the first autumn rain the grass springs up like magic, but it is thin and scattered, and the flocks must cover great areas to get a bellyful. The weeds do better than the grass, but the sheep and goats make no distinction.

As the season wanes the grass dries, turns black and disappears, but as long as a few blades remain the flocks are kept on the desert. During the rains there is usually sufficient water in the pastures, but when this gives out the flocks must be driven to a well, sometimes forty or fifty miles away. Here the herdsmen meet their tribesmen with other flocks, and there will be much tea drinking and talk.

The black tent is their home. A tiny fire is made from camel dung and water is heated for tea. After the morning tea, a hole is dug in the sand beneath the fire, a paste of meal and water flavored with salt is poured in the hole, and covered. At nightfall a solid loaf of bread is ready for the evening meal.

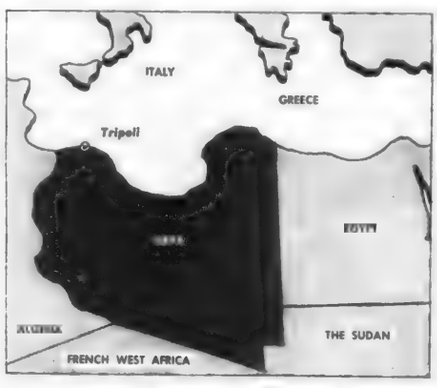
Khalifa's five hectares (about twelve acres) in the oasis is in a half dozen parcels, the largest of about three acres. Here is his whitewashed mud hut of five rooms and a series of palm frond lean-tos, in one of which he keeps his chickens and the cow when she is at home. More important than his home or his camel, or even his wife, is his well, a magnificent well, fifty feet deep, with a constant five feet of clear, sweet water. From this well, Khalifa irrigates the three acres of the homestead and parts of other plots during the driest part of the season.

An oasis, to a desert Arab, is any place where one can get water by some means or another. Usually the water is brought out from wells, thirty, forty, or even fifty feet deep. Some oases have artesian wells, and occasionally there is a desert spring that gushes great quantities of water to create an Eden of date palms and flowers and great melons.

But Khalifa must labor prodigiously and long to get water out of his well into the irrigation ditches of his fields. When the

Hour after hour the pupils in a Moslem school repeat passages from the Koran, committing them to memory. The teacher is a Sudanese, a descendant of slaves brought to Libya from central Africa. His salary is ten cents a week per pupil.

well was dug by one of Khalifa's ancestors, maybe a hundred, or two hundred, or five hundred years ago, this ancestor also built a masonry shaft on each side of the well. Between the two shafts is a spindle with a pulley. A rope runs through the pulley. On one end of the rope, in the well, is a goat skin bag, called a dalu, holding perhaps ten gallons. On the other end of the rope is hitched the family cow or the camel. It usually takes two workers to get water out of a well —one to drive the animal up and down the ramp, the other to empty the dalu. It's a slow process, bringing the water up fifty feet, a few gallons at a time, and one can't irrigate very much land that way. This is how it was done a thousand years ago, and not one whit has it changed.



Libya is wedged between Algeria and Egypt.

Water is the key to Libya's future. In the desert, foreign commissions are reviving an old Roman method of conserving water. This is known as water spreading and is simply a series of dams, terraces and run-off basins devised to catch, spread, and hold the flash floods until the water can soak into the soil. Engineers surveying for the dams and terraces have invariably found that the Romans have been there before them. The new dams follow closely the ruins of those built by the Romans two thousand years ago. The engineers hope that in time all the water falling in the productive areas of Libya can be channeled into the soil and none will reach the ocean.

On the three acres that Khalifa irrigates he raises almost all the food for his family—carrots, onions, potatoes, black beans, squash, and tomatoes. About an acre is in peanuts, his one cash crop. He also plants a little sorghum and a little corn.

Khalifa's remaining nine acres, in several parcels because he inherited them that way, are on the outer fringe of the oasis and are difficult to irrigate. In a pinch, when his crop suffers, he may carry water or trade with a neighbor, or resort to a wasteful method of running water through a maze of ditches through and around his neighbors' fields to his own. On these outlying plots he has alfalfa and barley. Two years ago he planted two dozen olive trees given him by the Americans under Point Four. These trees will not bear a profitable crop for twenty years. His sons and grandsons will harvest the olives.

Around his house and scattered about his twelve acres Khalifa has two dozen date palms. He also owns another dozen palms, several of them on what might be described as a tribal commons in the oasis, and two of them forty miles away in a village on a property which he does not own. He inherited the title to these trees. Khalifa visits his palm trees twice a year, in the early summer to place a male flower in the head of each female tree, and in the fall to harvest the dates. His title is traditional and he cannot support it by document or record, but he knows they belong to him, everybody knows they belong to him, and that's that. No man dares, and no man will, take a single date from Khalifa's trees, wherever they may be.

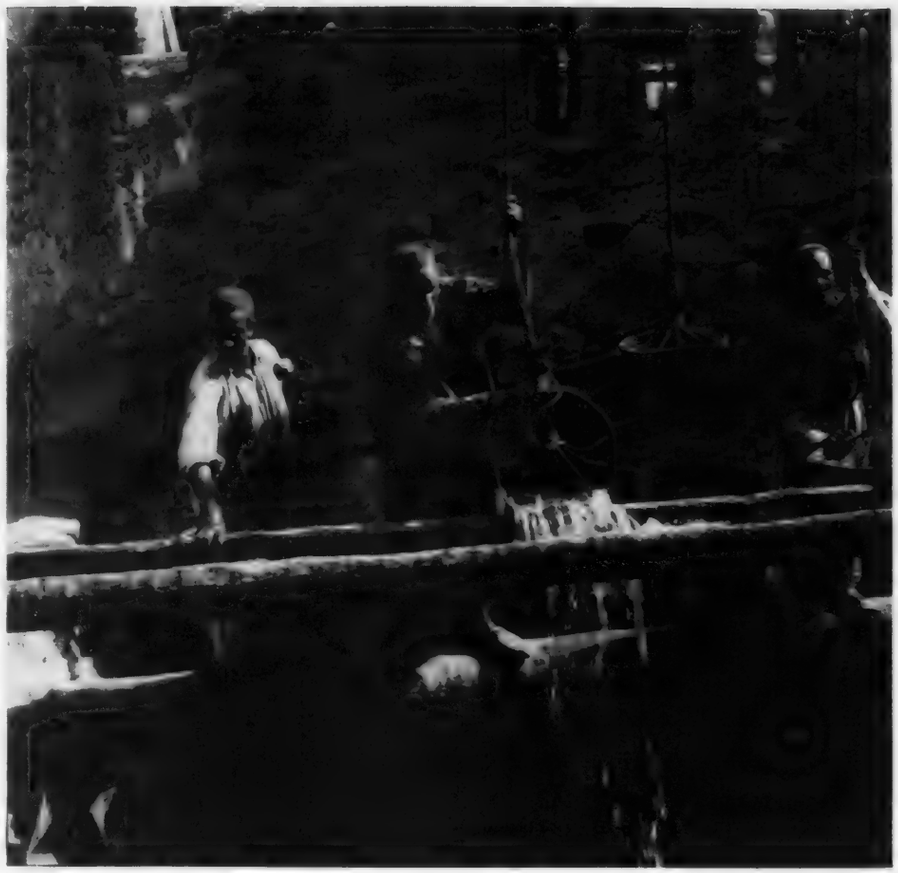
In addition to the three dozen-odd palm trees which Khalifa owns, he has two orange trees, a tangerine tree, a mulberry tree, and an apricot tree. All are heavily infested with the Mediterranean fruit fly. Last year Khalifa saw a demonstration of fruit tree spraying by an FAO technician and was induced to try it. This, in many ways, seemed to him to be interfering with

Allah's plans for the world, but he did use a little of the spray. While it was too little and too late, he harvested some good fruit instead of the usual puny, knobby product he was accustomed to. This year he plans a bigger spraying program.

Except on the irrigated portion of Khalifa's domain, yields are meager. In an average year he will get five grains for every grain he plants in his dry farming in the desert. An extra good year, a bumper crop of twenty-five for one might come his way. He takes good yields of alfalfa from his oasis fields when he can supplement rainfall with irrigation. His irrigated peanuts yield heavily and he grows as many potatoes and tomatoes as a good American farmer does on good land, thanks to new varieties brought in by Point Four and FAO. While Khalifa uses most of his camel dung for fuel, he uses the sheep and goat manure for his oasis fields. Commercial fertilizer is almost unknown to Libyan farmers. If he has the money, he will put a little on his potatoes.

The planting season for grain extends from late winter to spring—whenever the accumulated moisture is thought sufficient to sprout the seed. Harvest comes in the early summer. On irrigated land a continuous series of crops can be grown and in the irrigated gardens carrots, tomatoes, potatoes and other vegetables are growing the year 'round.

Like farmers everywhere, Khalifa complains about the weather—the sleet and cold of the winter season, the stifling heat of the summers. The highest temperature on earth was recorded near Khalifa's oasis —140 degrees in the shade. There will be an occasional snowstorm, an occasional frost. And when the skies darken on the horizon, Khalifa trembles—a ghibli is working up. These blasts of hot sand and superheated air strip the foliage from the trees, blacken the pasture grasses, and dehydrate the human body. They may last for days.



A farmer empties a dalu of water into an irrigation ditch. Water is brought out of the well by animal power. The dalu, made of goat skin, is as old as history.

Here an underground stream fills a wide pool in the desert and around it spreads a lush oasis of palms and gardens.

Khalifa is never too far away from hunger. If Allah is willing, and sends the good rain, and if the locusts are not too bad, and if his animals thrive, he will feed his family reasonably well and may have a little left over at the end of the year. His family and livestock will eat all the dates, almost all the vegetables, and all the fruit he raises. He will likely not grow enough barley and wheat for the bread and porridge which make up most of his daily ration. He will do considerable bartering, trading surplus tomatoes for a kilo of sugar, or a couple of hens for a packet of tea. He will not often have meat—it is a luxury. An old hen, or an old ewe past lamb-bearing age, or even his camel when he has become lame and his hair falls off and he can't rise under a load, will go into the pot. But otherwise he goes meatless, reserving that luxury for the feast day following Ramadan and for weddings. He sells a little wool from his sheep, a skin or two, his peanuts, and perhaps a few potatoes. He will not see more cash in hand than $30 for each member of his family per year. He is often in debt. While loaning money at interest is illegal in the Moslem world, he knows where he can sell his crop in advance—at a sacrifice of course—but his family must eat.

Should he lose his camel, tragedy has indeed struck. An ordinary beast will cost him $100; a good one at least $150. A donkey will cost him $50 and a cow the same as a camel. That is more cash money than he has in hand during the whole year. He must save against such a possibility.

Planting by Allah

Khalifa's farming and the Will of God are so closely tied together that he can not tell you where one leaves off and the other begins. To Khalifa, the land and the air and the water belong to Allah and it is only by the generosity of Allah that man uses them. It would be presumptuous to interfere. Everything, in some mysterious way, is for the best—even a drouth and the locusts.

When Allah does beckon, when he shows his good will, Khalifa jumps to attention. Let a cloud appear in the sky, Khalifa galvanizes into action. He shouts to his family and the sack of seed barley which he keeps well protected in his best room is brought out and scattered over the unplowed earth; Khalifa rounds up his camel, repairs the harness and looks to the plow. And should the precious drops begin to fall, he goads his stubborn and reluctant beast into a fast shuffle; the pebbles and the sand fly as Khalifa guides the

The Libyan Arab does his trading in the marketplace. In this section cattle are bought and sold. Beyond is the camel market and the fruit stalls. Haggling over prices is regarded as a social grace, and enjoyed by all. Every large oasis has a marketplace.

one-handled plow across and across the planted field. Now the barley is planted—Khalifa has done his part and he forgets about the whole matter until harvest time, leaving the situation in the competent, if unpredictable, hands of God.

The plow, little more than a pointed stick with a handle, does not turn the earth, but furrows it. Some of the grain is covered too deep, some not at all. Cows, camels, donkeys, and horses are all used as draft animals.

Khalifa will either pull the ripe barley out by the roots or he may cut it with a hand sickle, depending on how good the crop is. If it is a light crop he will pull it, being careful not to shatter a grain. The neat piles of straw are carefully gathered in baskets and taken to the threshing floor, where the grain is either flailed or tramped out by the family cow and the donkey, both muzzled to keep them from snacking. The grain is winnowed by throwing the chaff into the air and stored in baskets or home-woven sacks in the rat-tightest room in the house.

Khalifa's wife grinds the grain into a coarse meal in a stone mill—two stones turning one upon the other. The meal is cooked over a tiny dung or charcoal fire into a stiff porridge. A heap of porridge is dumped into a large bowl, olive oil is poured over the heap, and the family digs in, eating with the right hand—this is the day-in, day-out food of Khalifa and his family, the noon and evening meal. The meal is usually topped off by a handful of dates as a sweetmeat.

Khalifa will have a number of subsidiary meals, or snacks. If a guest drops in, he will offer the inevitable tea, palm juice, dates, perhaps some camel cheese, yogurt, or fruit. He and his family consume a vast gallonage of tea, how much and how strong depending on the state of his resources. A favorite mixture is tea with sugar, with almonds or peanuts added for flavor. The guest traditionally accepts three rounds of tea. The first round is strong and astringent; the second is strong but sweetened; the third, sweet and mild. It is poured from pot to pot and if properly made will have a head of foam as it is offered to the guest. Khalifa spends from a fifth to a fourth of his meager cash on tea and sugar. Sugar costs him twelve cents a pound; tea about a dollar a pound.

In summer the Arab drinks some lemonade, but his preference is for legby, palm juice, obtained by tapping the main stalk of a palm tree at the top. Legby is a pleasant drink and if allowed to ferment has considerable authority. Because a Moslem is not permitted by Koranic law to drink intoxicants, he is sometimes faced with a delicate decision—has the legby gone too far? On certain occasions, as wedding feasts, it is suspected that a good deal of the legby is aged more than the Prophet would recommend.

There Ain't No Such Animal

In the late spring Khalifa becomes a Bedouin, a nomad. He takes his tent and his family and goes to his desert fields and harvests the barley there—if he hap-

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Khalifa Suei (right) offers the first of three cups of ceremonial tea to a guest. It is bad manners to bring up a business matter before the tea is finished. When the grass grows (below) in the desert the Arab takes his tent and his family and becomes a nomad. The mother bakes bread in the sand, the daughter minds the babies.

Fast Milking

A look inside the cow shows why she should be milked out as rapidly as possible after let-down is stimulated

By James O. Jordan

THE ADVANTAGES of fast milking, speedy milking, timed milking, or whatever term you want to give it, have pretty well been established. In tying down the best way to get the most milk out of a cow, dairy scientists have resorted to some bizarre experiments.

They milked one cow a quarter at a time; another they stimulated by washing her udder, then allowed twenty minutes to elapse before they milked her. They threw a clawing kitten on a third cow's back; exploded paper bags and annoyed the animals by other sly and devious tricks.

Why was this done; what were the results; was there method in this madness?

The production of the cow that was milked a quarter at a time decreased proportionately as each quarter was milked out. The quarter milked first gave the most milk while the last quarter gave the least.

The cow that was forced to wait twenty minutes between stimulation and milking gave a third less milk than cows of the same productive capacity which were milked out immediately after being stimulated.

When the cows were annoyed and frightened they gave considerably less milk than when they were not disturbed.

The experiments demonstrated conclusively that milking a cow as rapidly as possible—without distractions—is one of the answers to getting top production from her.

Dairy experts have been preaching fast (or rapid) milking for years, and there is sound logic behind their recommendations. Here are the advantages of fast milking:

You will get more milk.

You will spend less time getting it.

You will lower the incidence of mastitis in your herd.

You will prolong the productive life of your cows.

By using fast milking as the basic building block in a well-managed milking program, you can look forward to more profitable dairying. A well-managed milking program can be translated into seven fundamental rules. These rules should govern a dairyman's actions each time he goes to the barn to milk his cows. Stated simply, they are:

ONE—Stimulate the cow to let down her milk; one of the best methods is by washing her udder and teats with a warm, wet cloth.

TWO—Never allow more than two minutes to elapse between the washing (stimulation) and the actual milking. The less time the better.

THREE—Milk the cow out completely as fast as possible.

FOUR—Remove the milking machine as soon as the milk ceases to flow.

FIVE—Strip by machine to save time and to avoid extra contamination of the milk.

SIX—If there are slow milkers in your herd, put them either at the front or the end of the line to prevent them from slowing up the routine.

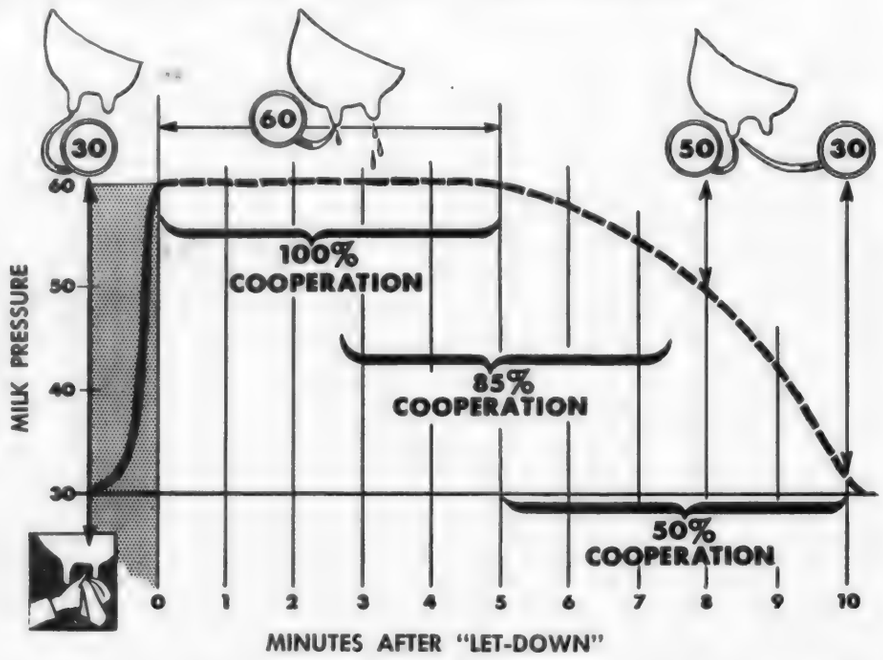
SEVEN—Keep cows contented. Fear or excitement will interfere with the normal let-down process, and only a portion of the milk will be obtained.

The logic behind this set of rules lies deep in the dark interior of the cow. It is here that the milk is manufactured in a highly complicated physiological process. In recent years dairy scientists have been able to explore and explain the cow's milk-making machinery. The principles of good milking are based on their discoveries.

The cow manufactures milk from materials in her blood and stores it in her udder in millions of tiny bulblike structures known as alveoli. Each of these storage cells holds only a fraction of a drop of milk. The quantity of milk stored in each alveolus is so small and so light in weight that gravity will not pull it down through a system of ducts into the cisterns of the udder. Before the milk can drain into the cisterns of the udder where it is available to the milker, it must be squeezed out of the alveoli by the cow herself. This squeezing-out process is automatic. The cow has no control over it. But under ideal conditions a dairyman can control the process if he understands what goes on inside his cow at milking time.

Control over the milk let-down starts with stimulating the cow's udder and

The chart below shows how pressure in the udder rises to a peak a few minutes after stimulation, is maintained for about five minutes, then falls sharply. You get the most milk when the milking is done within two minutes after stimulation.



teats. The application of a warm, wet cloth has much the same effect on the cow as the warm, moist mouth of a nursing calf. In either case, the stimulation sends a signal to the cow's brain. The mental signal causes the release of a hormone into the animal's blood stream. This hormone is called oxytocin, and its presence in the cow's blood acts to bring about the milk let-down by squeezing the milk out of the tiny storage cells.

Of course, a cow can be trained to respond (let down her milk) to almost any kind of stimulus. She is a creature of habit and can be conditioned to respond to such things as the ringing of a bell or the rattling of milking utensils. But washing of the udder and the teats before milking is the best stimulus, not only because it fits in more readily with the routine, but because it is a good sanitation measure.

The time interval between application of the stimulus and release of the hormone into the blood also can be regulated by training.

Some dairymen go down the line and wash all their cows at once. Then they start the milking. In this kind of procedure as much as an hour and a half may elapse between the washing and the actual milking. But here the cow is not responding to the washing. She responds to the milking machine. As soon as the teat cups are put on, she lets down her milk. In other words, the touch of the teat cups has replaced the washing as a stimulus.

Unfortunately, the oxytocin remains active only for a short period of time once it begins to flow. Unless actual milking is begun within one to two minutes after the stimulation is applied, the hormone will disappear from the blood stream and the milk harvest will be incomplete. Some of the milk will remain in the alveoli where it is lost to the milker. The rapid dissipation of the oxytocin also means that the cow must be milked out rapidly if all of her milk is to be harvested. Once the

(*Continued on page* 129)

Every dairyman is on a par with every other dairyman with a similar herd as he enters the milking parlor. But how efficiently he does his milking may make a big difference in production.

How to Make Money on 12¢ Hogs

DURING THE PAST YEAR when hog prices began to sag like an overheated sow, hog farmers began re-evaluating their production methods. As prices hit the skids, hog men sharpened their pencils and did some close figuring on their own break-even point. Some were hurt when hogs reached 15 cents; some had to throw in the sponge at 14 cents. The men who survived, or even made money when the market reached its bottom of 10 to 12 cents, are worth studying.

Here is the story of the methods used by three hard-headed Hoosier hog farmers who have learned the art of low cost pork production. Each has developed his own special methods—the first plays the markets; the second retreats to a prepared position; and the third saves by specializing. Each is doing an outstanding job during good times and bad.

Elmo Hannahan, who farms 422 tillable acres along Sugar Creek near Boggstown, Indiana, keeps a sharp eye on the markets—both the markets where he buys and the markets where he sells. Though Hannahan and his three sons, Pat, Dick, and Mike, have incorporated many excellent practices into their whole operation, marketing seems to play the most important role in keeping them in the hog business at a profit. The Hannahans run a herd of some 30 sows which are farrowed twice a year. Farrowing takes place in a central, heated, farrowing house which is set on a large concrete slab and surrounded by quarter to half-acre paddocks. After farrowing, the sow and pigs spend ten days in the farrowing house and are then put out in the paddocks, five sows and their pigs to a paddock. "I know that it will make some people's hair

Elmo Hannahan, the market man.

Francis Fletcher, the thrifty feeder.

James McCutchan, the specialist.

stand on end," Hannahan said, "but we have used these same paddocks continuously for ten years without rotation and without disease. I think that our major protection against disease trouble has come from the fact that we feed well, we worm early and regularly, we spray for lice, we have a good program of vaccination, and we disc the fields heavily once a year in the spring."

Hannahan believes in good pastures, in letting the pigs scavenge the wheat fields and the corn fields to save all the feed they can, and in feeding the best feed available for the nursing sow and for pigs up to 80 pounds—after that he lets them rough it a bit. Being blessed with a farm which has a very high water table, he is able to punch down an eight-foot sandpoint pipe any place on the farm and strike water. This makes it possible for him to put the pigs out in any field on the farm with a minimum of watering labor. To save feeding work, he feeds directly from the corn crib. "It takes a little more time to fatten out on ear corn," he said, "but the labor saving is worth it."

In the old days, he used to put some of his pigs with his fattening steers. Since he has switched these 100 beef animals to stilbestrol, he no longer lets the pigs scavenge the droppings.

When the pigs reach around 160 pounds, Hannahan brings them in to the central farrowing house and the concrete slab for final fattening. Here he can bring them up to 200 to 210 pounds and top them out for uniform loads to market.

"Year in and year out, we have found that the best markets for pigs come around June and July, and January and February," Hannahan said, "so we have shifted our farrowing a little to try to hit these markets with our finished pigs. The so-called fall farrowing we do in June and our spring farrowing is in December. This gives us six to eight months to bring the pigs to market condition, which is certainly no rush."

June litters are ear notched and gilts from the best producing sows are selected for the replacement herd. Hannahan plans to get two litters out of a sow and then sell her. In this way he keeps her while she is making her best gains and he also profits taxwise. "Usually we can get about twice the value of the replacement gilt for the sow—that means cutting down on our investment—and when we sell the sow, we need only report half her value as taxable income, because she is a breeding animal," Hannahan explained. "Beside that, I hate to have my sows get too heavy; they're not as good mothers and they're too sluggish to handle well."

But handling the herd so that pigs are sold on the best market is only half of the picture; the cost of the feed that goes into them is just as important to Hannahan. An example of his keen market sense is the way he has handled his corn crop this year. Convinced that there would be a large spread between the price of cash corn and the government support price, Hannahan decided to abide by the acreage allotment. When he harvested his corn last fall, he sealed it and got the support loan on it. This gave him $1.52 a bushel. Cash corn was selling from $1.20 to $1.24 a bushel in the neighborhood, but there was a still better buy. Hannahan was able to buy corn futures on the Chicago grain market at $1.02 a bushel. During the year, he has traded the miller corn futures for the feed he hauled from the mill. The feed bought this way cost him 33 per cent less than his own corn brought.

Strategic Retreat

During normal years, Francis Fletcher, of Arlington, Indiana, raises his hogs on about the same program as his neighbors. True, he does a more careful job than most farmers, but the system is the same so long as the corn-hog ratio is normal. When hog prices start falling, however, Fletcher reacts immediately.

"In the fall of 1952 we first used this system when we saw hog prices start down," Fletcher said. "I figured that the

(*Continued on page* 140)

What you invest in a hog is one jaw of the price pincers. If you can keep the cost of feed, labor, and buildings down, you can make out when prices drop. The other jaw of the pincers is the market price. Farmers who ship uniform loads of 210 pound hogs have the best chance of coming through the cost-price squeeze with a profit.

Field Shelling

New machinery for harvesting shelled corn cuts handling, hauling and storage costs. Here is a line-up of available equipment, what it costs, what it saves, what the change-over requires

On corn combines a front-mounted snapper replaces the usual sickle-bar header. Only the ears go through the combine. The golden grain (opposite page) pours from the spout ready for the bin.

Picker-shellers are available in either self-propelled models like the above, or in pull-type models. They are standard pickers without the husking beds and with shelling equipment added.

"I'M HAPPIER with my corn combine than with any piece of equipment I ever owned," says Charles Ebrite of Eaton, Indiana. "It leaves less corn in the field than any picker I've used and the men at the elevator told me they never saw cleaner shelled corn."

Last fall, Ebrite put 16,000 bushels of corn through his combine, a self-propelled unit with corn attachment. "It just eats up 80 bushel corn," he says. "No strain on the combine like you'd expect. I picked up one rock, which didn't give any serious trouble, and I was only hung up once. My cornpicker used to be hung up all the time. With a combine, and no wagons to pull, you just back up and start fresh. The picker attachment cost me less than a regular picker. My old picker is for sale though I'll still use my stationary sheller to shell government corn for my neighbors."

Ebrite, with some help from his wife and son, keeps about 40 brood sows, and puts out a considerable acreage in soybeans, wheat and oats along with 75 acres of corn on his 240 acres. In 1955 he got his corn in early enough to do some custom corn harvesting with the combine. He made a fair profit by charging $4.00 an acre plus 4 cents a bushel, which was much cheaper to his customers than the prevailing custom rate of $5.00 an acre for regular picking plus 5 cents a bushel for shelling. "Saved them a lot of hauling labor," says Ebrite, "and they got their corn in early with less field loss.

"Early picking gets all the corn—before the borer damage causes fallen stalks. We used to lose a lot of corn by waiting until the bean harvest was over, but now it takes only an hour to switch from the grain header to the corn attachment and we go from corn to beans according to the weather. When the beans are too wet and tough, the corn snaps and threshes just right.

"On custom jobs, I can cut 17 or 18 acres of corn a day. On my own corn, my Missus moves the shelled corn wagon along the edge of the field. When we have two wagons filled, we come in and put the corn in the drier, then go back for more while the drier is running. The cobs are left in the field where they belong and there're no husks to blow around the yard.

"Since I can cover more acres in a day, I can run the combine cheaper than I could a pull-type picker. The corn is around 27 per cent moisture when we begin combining. Drying costs me just under 3 cents a bushel for the fuel oil and electric to drop the moisture about 15 points. I store it at 12½ per cent, which gives me a leeway under government moisture requirements for safe storage."

Picker-Sheller

"Why haul and handle, dry and store a lot of cobs?" asks J. A. Cornelius who raises 450 to 500 acres of corn on the Whitewater River bottoms near Harrison, Ohio. "Most of the moisture is in the wet cobs. They are half the weight and more than half the bulk. Storing and drying ear corn is like trying to store wheat in the sheaf. With a picker-sheller the corn is ready for the drier in one pass over the field.

"We used to have a slack time in early fall—just sitting around waiting until the corn was ready to pick. Like as not, the bad weather got there first. Last year we got about 100 acres picked and shelled before the neighbors got started with regular pickers. A picker-sheller gives you a jump on the harvest. Late picking of dry corn slows you down, plugs up machinery. We used to have to stop altogether on very dry afternoons to keep from losing so much corn with a picker. Now we can go right on. Some varieties of corn don't husk clean with a picker. With a picker-sheller, any corn comes out clean. And you're out of the field before the soil packs. We sold some of last year's early corn at old corn prices."

Cornelius operates a three-wheeled, self-propelled Uni-Tractor, his "mule" to which a forage cutter and other harvesting units attach. It takes about 15 minutes to change to the picker-sheller unit. Cornelius says, "The picker-sheller works like any picker. The ears pop off in the snapping rolls and go into a regular sheller, that's the only difference. The sheller will handle 30 per cent corn, but you do

(*Continued on page* 125)

JOHN DEERE
JOHN DEERE
10

The Good Life of the Gilfilens

By Chester Charles

Photographs: Robert B. Goodman

NO ONE EXPECTED Ed and Jane Gilfilen to last more than one season on the farm. That was seven years ago. Now there are five more little Gilfilens putting down roots in St. Martin, Ohio. To them, the family farm is still the best place to live.

St. Martin is too small to be called a village. There are two stores, a school, a church. From his window, Ed can see the school and the church beyond. The Gilfilens are small farmers. They are not small people. Measured in dollars, they are insignificant, but by the yardstick of happiness, they are to be envied. They work together; Sundays they kneel together. Their's is a common goal, a sharing of responsibility, and quiet faith in themselves. When Ed steps out of his back door, he's in business. More likely than not, Jane and five little Gilfilens are right behind him.

Ed and Jane were married in 1949, not long after he returned from a stretch in Korea with the army. Disaster sought them out early. Jane lost her mother, her only close relative, in a car accident. They lived in town then, spending weekends on the family farm, while Ed completed his last year at college. Each evening, after classes, he drove the 34 miles to the farm to tend a batch of 625 broilers in batteries. When the broilers reached two pounds, a fire destroyed them all. On a weekend trip to the farm, three months before her baby was due, another car crash left Jane with six broken ribs and a broken arm.

The farm, a run-down 63 acres of poverty grass, had been the home of Ed's grandparents. As a child, he had spent frequent summers there. The idea of trying to make a go of farming was not Jane's idea of how a man should apply a college education. But it was a home and if it made Ed happy, that's where she belonged, too. They loaded the truck with the furniture Jane's mother left them. The baby crib they took along has never been empty. Stevie followed Hank, then Terry and Peggy. Now ten-months-old Janey will soon have to surrender the crib to another Gilfilen, who is crowding the calendar. "It's our well water," says Jane. "It's even worked on a childless couple who visited us."

Are You Crazy, Cousin?

Shortly after they moved in, Jane urged Ed to get an estimate on having the place fixed up a bit. Maybe they could get a loan. They called in a carpenter. He looked things over. Then he 'lowed as how he was pretty busy. As he left, he pointed out that there was right smart work ahead.

That first year was an uphill fight. Their corn sickened to 30 bushels per acre. They lost half their soybeans because they couldn't get anyone to combine them on time. Their sows lost most of their pigs. A heifer drowned in an ice-coated pond. But somehow the cellar shelves were filled with canned goods from the garden. There was some good hay in the barn from sharing work in a neighbor's fields. The gilts grew fat on the nubbins gleaned from the cornfields.

There wasn't time in an 18-hour workday for the Gilfilens to feel sorry for themselves. It wasn't only the work; there was also the learning of how to do it. Even learning the simple things, like the easy way to lift a bale of hay, took patience.

"The baby crib has never been empty since we came to St. Martin. The babies always come along at planting time or when the hay is ready to be cut."

Patience you learned first. Ed learned to juggle the remodeling on his home with digging graves in the frozen ground for stillborn calves, the dormant sprays and the full-blossom sprays, and manure hauling while the blisters turned into callouses and the callouses tightened and set his hands.

For Everything A Season

The seasons blurred. Summer came on gradually, while the corn inched upward. Autumn faltered, was gone, came back again. The field work lulled, the machinery stopped and hands took over. Now a man could wire the barn, pipe water to the kitchen, cement the cracks in the well. But at County Fair time a farmer indulged himself and his family. That was a right.

Fall harvest began. Picking the corn and combining the beans stretched across weeks. The calves went to market; the check brought a few new clothes, boards for a farrowing shelter, a spreader. The washing machine would have to do another year.

January was like February, Monday like Tuesday, with the feeding, the shovelling, the hammering, the monotony, then a surge of new hope with the first calf and despair when its mother refused to let it nurse and broke its neck with one vicious jab of her hoof. More calves arrived and then a series of lambs, most of them greeting the world on raw nights at two in the morning. Winter edged along and the midnight checkup became routine. You scrunched to the barn, flashlight in hand, a misty chill outside, an ammonia mugginess in the cowshed. You took a final glance at the chicks under the brooder. Back in the house, you pulled the comfort over the youngest baby, who was already getting too big for the crib. The wind rattled the bedroom windows.

In the morning you awoke to find spring had slipped in unawares. You were back at the beginning, another year older, a little more firmly rooted.

The Gilfilens had no relatives to lend a hand. They had a few weekend work parties for friends out from the city, but the cooking took more time than if they had done the work themselves. There was discouragement and very little money, but life became a joy around the dinner table, for as every woman knows, food can fix a lot of things. It took only a couple of candles on the supper table to blot out the drudgery. It didn't cost anything to laugh. Jane told her friends, "A farm wife always knows where her husband is. Just listen for the sound of his tractor."

Every Day a Crisis

What farm life held for Ed Gilfilen, his wife failed to understand. Constantly at the mercy of the weather, he couldn't plan to buy anything when he couldn't count on anything for sure. Once a sow crushed her litter; again, he stood helplessly looking out the window while the hail ripped his corn crop to shreds.

Their second winter was endless. The mud was always with them; the green firewood hissed and fried and died in the kitchen stove; the water bucket wouldn't stay filled. Jane never got far beyond the back door.

Toward spring, something happened to Jane. Ed, off on a trip for planter parts, had asked her to keep an eye on the ewes. At mid-morning she remembered. In a cold March drizzle she waded through the mud to the barn. Just inside the door she found a newborn lamb, wet, neglected. An acrid fluid clung to him, smarting her hands. He smelled like crushed ragweed. His legs were rubber, his mouth smeared red and viscid, his nostrils bubbling muscous. His skin hung in wrinkles, the wool like a dirty dishrag. She stooped and held him against her. His heart beat with

A picnic in the fields is fun; besides it saves time when time is precious.

a furious pounding beneath his frail ribs. A glaze crept over his frightened eyes. He opened his jaws, clamped down on her finger and with surprising strength held tight while his tiny body convulsed and thrashed. He was dead. Jane rose from her knees on the straw and felt a stirring of the unborn child within her. The ewes looked up at her with trusting eyes. These, too, needed a woman's tenderness and from now on she would give it to them.

The kitchen, the house, were no longer her boundaries. Her husband was not a worker who went off in the morning to a world from which she was excluded. The weevils in the grain bins, the rain at corn tasselling time, became her concern as well. On the welfare of the livestock in the barns, the welfare of the family depended. The garden, the family cow, were security. Her youngest, still in a crawl, was as dependent on that cow as the calf, wobbling to the teat in its first effort to nurse. There was a lot a woman could do. An extra pig saved meant new clothes. The orphan lamb, warmed by the kitchen oven and bottle-fed, meant new drapes for the living room. Everything tied together; each leaned on the other.

World of Wonder

To the children, the farm is joy and excitement. For Hank, turned six, throwing hay down to the cows is a part of his living and not a chore. A boy can take pride in the whiteness of the eggs he gathers. Stevie, four and a half, hastens to show how he holds a squealing pig while his father clips its needle teeth. There is a creek where cool mud oozes between a little girl's toes; and rabbit tracks to follow in the snow, and spider webs to trace in the granary. When summer work presses, they go with their mother to the fields with their father's lunch and there's a picnic under a tree at the end of a row. On winter nights, after the stock has been bedded down and supper is done, there's popcorn in front of the fireplace.

So much happens. The miracle of birth, a lamb giving its first trembling bleat, the pigs scrambling for a teat, the bursting of blossoms in the orchard; these are the things a child can see or hear or touch or smell. Death, too, they know. The bull killed by lightning, the drowned cow floating in the pond, are part of the pattern and the patterns within patterns of life and death; and neither holds fears for them. If you are old enough to wield a rake, you help cover the burial trench, and like father you don't look back.

For Jane, accepting the cycle of birth and death was not easy. Always she sensed that loneliness among animals in the birth

The egg money belongs to the farm wife to spend as she sees fit. First, expenses come out for hired labor—candy money for Hank and Stevie who gather the eggs and keep the nests clean.

Farm animals have a habit of being born during sudden spring storms or, preferably, during the small hours of wintry nights when the coffee pot is a farmer's only companion. Nature refuses to be hurried.

Someone, usually the Missus, is always needed on the other end of a board or a crosscut saw. Laughter can turn a chore into sport.

and death process. They look at you in their helplessness, fearing you, yet depending on you, while the herd stands stolidly by, untroubled. But try to catch a ewe or rope a calf and the others ward you off. The ram stands in your way, the bull squares his shoulders. But an animal in the throes of birth, or the agony of death, is shunned by its kind, and you can do what you wish, and they ignore you as well.

The Brighter Side

It isn't all work for the Gilfilens. One night a week Ed devotes to a local service organization. Time must be allotted the soil conservation meetings. The district soil man is a farmer's best friend.

Ed doesn't envy the city worker his leisure. "In town, what would we do with our leisure," he asks. "Raise African

(*Continued on page* 91)

So much happens on a farm to excite a child's awareness. The new lamb, still wet, wobbling on rubber legs to his first meal, the tiny shoots of corn popping out of the ground, the entire cycle of life, and death too, are a world of wonder to a child's unquenchable curiosity.

How to Move IRRIGATION PIPE

Half the cost of irrigating can go into pipe moving; mechanizing saves labor and cuts costs

ON A HOT DAY in August, 1951, Ray Quackenbush blew his stack. He had been working all day with his younger brother, Lyn, carrying irrigation pipe through the tall corn, and he was red-faced and steaming. His shirt was sweat-drenched and his pants water-logged; his face and arms burned from leaf cuts; he was powdered yellow with pollen that itched; and then it happened—he stumbled with a length of pipe held high over his head. "I really exploded! I threw down the pipe and walked back to the barn and started working on my pipe moving rig," Ray said.

The machine that Ray Quackenbush was building on the family farm at De Witt, Nebraska, was neither the first nor the last mechanical rig that farmers and engineers have dreamed up to move irrigation pipe. Ray Quackenbush worked on his device for three years, building it one way, testing it, and then making changes. He used vee belts and flat belts, chains and drive shafts—at one time he had parts from airplanes, automobiles, garden tractors, and washing machines all hooked together in one machine. Finally he produced a pipe mover that worked.

It was a spindley, tubular steel rig that rolled through the field on three long legs mounted on aircraft wheels; its two front wheels straddled three corn rows, the off-center rear wheel ran between the first and second row; it was powered by a seven and a half horsepower, air-cooled garden-tractor engine and by two six horsepower hydraulic motors. Ray sat well above the corn tassels and operated the mechanism—a giant boom that reached 30 feet to the left and picked up a length of pipe and deposited it 30 feet to the right for the next setting. His brother, Lyn, walked down the muddy row dismanteling the lateral and fastening the pipe to the boom; his father, William Quackenbush, walked down the dry row connecting the pipe with the new lateral. On its best behavior, the machine delivered a length of pipe every 60 seconds and did a good job of getting through the wet fields.

But the development of this machine came too late—Bill Quackenbush and his sons had succumbed to high pressure irrigation, where you can shoot the water out a couple of hundred feet and pipe is moved by wagon, instead of by manpower.

Not all farmers are able to side-step the pipe moving problem so easily because not every farmer irrigates soil that will stand a half inch to an inch of water each hour. But every farmer who uses sprinkler irrigation is interested in cutting down on the labor involved in moving pipe. Not only is the work hard and, in the case of tall crops, unpleasant, it constitutes around a half of the operating cost of irrigation. And this is the half that can best be trimmed for more economical operation; power and maintenance costs will remain pretty constant.

Cost-conscious farmers have shown an interest in the new equipment that cuts labor costs to a fraction of what they were. Today, the farmer has a choice of equipment that will do the job. In the past, the men who thought about this problem seemed obsessed with the pipe moving machine. As early as 1890 patents were issued on a rig that made pipe moving a breeze. The pipe was simply suspended by a balloon above the crops and pulled from one location to another by a rope. A more practical machine was put to use in the giant vegetable patches of New Jersey and on Long Island in 1940. These machines transported the steel pipe, which was then in use, from one row to the next by means of a moving belt. When lightweight aluminum pipe was introduced, it was found easier to move the pipe by hand and these machines were abandoned.

But still the inventors go on trying to produce the perfect pipe mover. Sixty miles north of Ray Quackenbush's farm a fellow inventor, Walter Herpolsheimer, worked on a very similar rig. Without ever having heard of or seen the Quackenbush machine he produced a blood brother to it which used a long boom to swing the pipe from row to row. To power his rig he used a Plymouth engine and six automobile self-starters. He, too, abandoned his pipe mover when he found that he could use big-gun irrigation on his soil.

But he didn't give up thinking of ways to save labor. With his high pressure system he uses three big sprinklers which he moves down the lateral from one outlet to the next every four hours. Normally an irrigator would move the big lateral when he had finished running the sprinklers down the line, but not Herpolsheimer. The new wrinkle he has given to high pressure irrigation is to run side laterals from the main lateral. When the big five-inch lateral would normally be moved, Herpolsheimer takes four sections of four-inch pipe and runs it off to the right and sets up his sprinkler at a new setting; when the sprinklers have all been moved up the length of the lateral to the right of it, he switches them to the left and uses his side laterals to irrigate over there. Then

A balloon-suspended pipe was an 1890 solution to the pipe moving problem. The inventor blandly ignored the cost and the weight of a pipeful of water.

he pulls in his wagon to move the five-inch lateral — and he drives on relatively dry ground. To make this system work, Herpolsheimer lays his main lateral in a path cut at right angles to the corn rows, making it possible to carry his side laterals down the rows for their settings. He claims it takes about thirty minutes for one man to move the side laterals and make new settings for all three sprinklers.

The Big Wheel

A typically American solution to the pipe moving problem has been to put wheels under the pipe and apply power. Apparently this solution came after a few experimenters had tried dragging a whole pipeline from spot to spot. The end result has been sprinkler lines which can be towed from one setting to the next either on wheels or on skids; lines in which the pipe itself acts as the axle for a series of wheels; and automatic systems that roll under their own power as they irrigate.

Skidding the pipe, which may have been the first power move, was not such a bad idea as long as the pipe stayed on sod. If the couplers were adjusted to hold together under the strain of moving, the pipe slid on a pad of grass from one spot to another with no difficulty. Over rough ground or stone, however, the soft aluminum was scarred and gouged. The solution to this was to put runners or skid pans under the pipe.

Putting wheels under the pipe made it easier to tow the long lateral. Wheels mounted on each side of the pipe make it possible to move the pipe lengthwise and the couplers permit enough motion to snake the lateral into a new irrigating position. A light tractor or, of all things, a horse or mule can supply the towing power. In using the tow system, the main line is usually run between two fields which are to be irrigated. The lateral starts on one side of the main and when the watering is over is towed across the main with enough of a bend to line it up with the next outlet on the main line and water a strip on the other side. This turning process slides the pipe over some 40 feet of ground between the two fields to be watered—this strip is best left in pasture crops.

One advantage of the tow line is that it can be used in tall crops on at least one of the fields. A distinct disadvantage is that in moving from one field to any except an adjoining field, the system must be dismantled and, with attached wheels and firm couplers, this is no quick job. Another disadvantage is the space needed for maneuvering between the crop fields.

A variation of the straight tow line is a lateral with wheels that swivel to a 45 degree angle to the direction of move. The lateral is towed on the oblique down the field to a point half way between settings and away from the main line; the wheels then swivel and it is towed the rest of the distance on the oblique toward the main line. This method can be used only on pasture or other low crops.

A different approach to the problem of making the pipe mobile is to attach the wheels to the pipe as though the pipe were the axle. When this system is used, the pipe moves directly down the field from setting to setting. Using a hand jack or a motor-driven wheel for power, a quarter-mile of lateral can be rolled down the field to the next setting in a matter of minutes.

Nothing is perfect, but the ease and speed with which one man can move one of these wheeled sprinkler laterals down the field makes up for some of the drawbacks, and there are some. In the first place, the pipe, which also serves as the axle for the wheels, is not far enough off the ground to clear high crops — so irrigating anything like corn is out. Then, a square or oblong field shape becomes more important since an odd-shaped field that requires changing the length of the lateral at different spots defeats the purpose of the system. Besides being regular in shape, the field cannot have obstructions such as trees and should be reasonably smooth.

A final problem with this type of wheeled system is the effect of wind. A good brake system to hold the line steady in a wind is a worthwhile accessory in windy country. Gordon Hawkins, an irrigation engineer from Spokane, Washington, describes what a high wind can do to one of these systems if they are not anchored with brakes. He and a Montana farmer were looking over the farmer's five-wheeled-lateral system when a roaring wind storm broke. They decided to leave the pump running in the hope that the water would add enough weight to keep the pipe from rolling. "The two of us stood there," Hawkins recalls, "not knowing what to expect when suddenly the line nearest us started slowly to roll over. One complete roll and the hose connection to the main line twisted closed and the line drained. Then the whole line was rolling down the field. I ran and braced myself against the nearest wheel of another line, prepared to hold on until the wind died down. Ten seconds later I found myself holding onto a bare wheel and the stub of a pipe as the rest of the lateral took off. Thirty minutes later the storm was over and the field had wheels, pipe, and parts scattered everywhere — as though a giant child had kicked over his tinker toys. When we assessed the damage, we found that eighteen lengths of pipe had been broken — just enough so that we were left with four rather than five laterals."

The tow-line can be moved lengthwise; methods of moving are shown on opposite page.
The automatic irrigator, below, runs like the giant spoke of a wheel covering a circular field that may be 300 acres in size. The unit is powered by the water pressure.

Wheels strung along this line make pipe moving a one-man, ten-minute job. A power wheel in the center of the line with a gasoline engine does the muscle work.

Automation Comes to Irrigation

For that mythical "man who has everything," something new has been produced —a completely automatic irrigation system. Out in Nebraska, the Valley Manufacturing Company has developed and put into production a system invented by a Colorado farmer, Frank Zyback, that

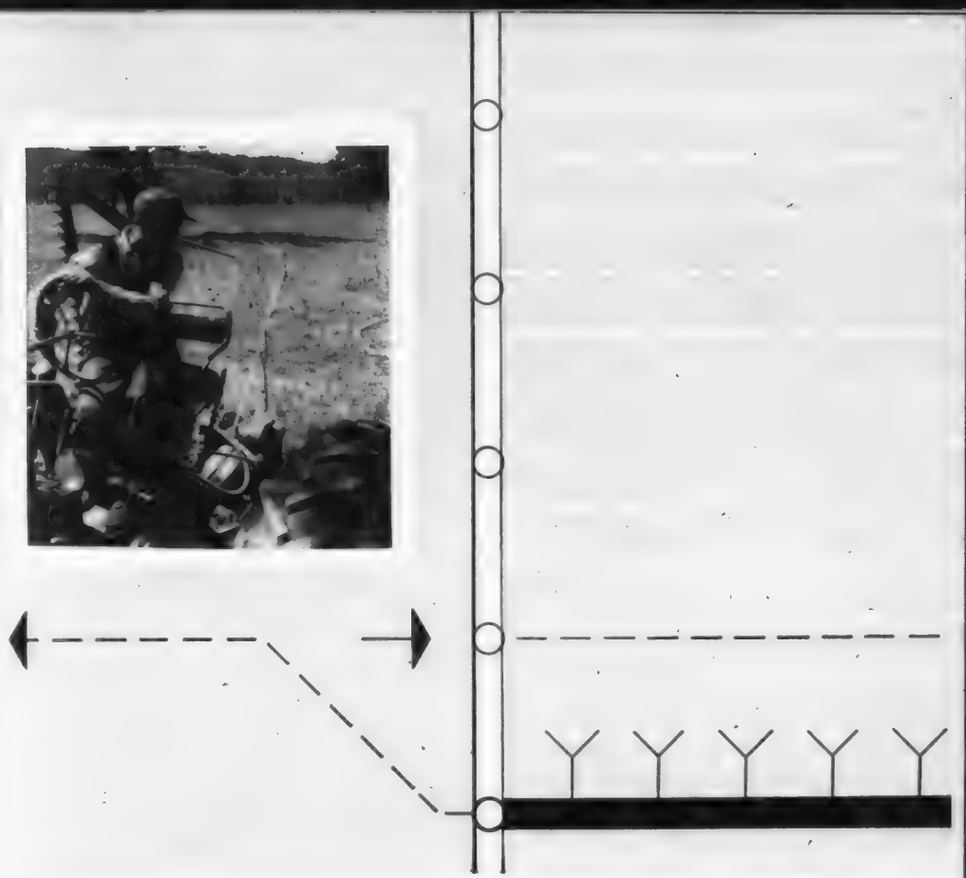
moves its own lateral and requires no more labor than the starting of the pump, once it is set up in the field.

This self-propelled system which looks, as one farmer put it, like a full-rigged sailing ship in the middle of a corn field, carries its pipe almost seven feet above the ground and travels in a circle from a central pivot. The steel pipe travels on wheels which are powered by the water which runs through the system, and each wheel unit has a tower over it with guy wires going down to the pipe to give it further support between wheels. Down the length of the pipe are a series of sprinklers ranging in size from very small sprinklers near the center, where only a small amount of ground must be watered, to large sprinklers on the other end, which has the wide sweep and must cover much more land. Each set of wheels, which are spaced at 100 foot intervals, travels at a different speed—a trick that is managed with a series of valves which govern their speed. The speed of the whole line is adjusted by a valve on the end wheel. The speed of the line, of course, determines the amount of water that is showered on the field.

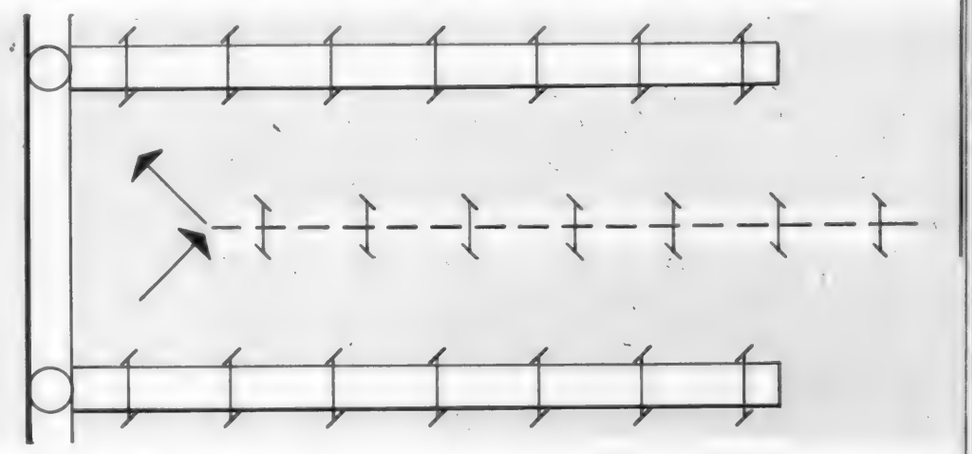
In order to have a sprinkler system operate in a circle in this way, the water must enter at the pivot point. In eastern Nebraska, where there is a large flow of underground water, most farmers punch down a well at the center of the field in which they plan to use one of these systems; or midway between fields if they plan to use it on more than one field. These systems can be moved from field to field — it takes about a half day's work to shift the wheels into a forward-moving position for one of the 640-foot long, 40-acre jobs — but it is recommended that the fields be adjoining. You can't turn a corner.

The amount of water it will take to run one of these systems depends on its size. The company recommends a supply of at least 200 gallons a minute for the standard 40-acre size (they make them smaller and larger) and up to 1200 gallons a minute for the largest system they have yet produced, a rig over a third of a mile long or, to be exact, a 1,960-foot pipe on wheels that waters 318 acres and takes 80 hours to make a revolution.

In the past, this system has had problems with the valves which regulate the wheel speed — if a set of wheels go too fast they will get out of line and may damage the pipe; if they go too slow or stop, the rest of the line may wrap right around them. They have also had some problems with the automatic switches that are designed to shut down the pump and stop the whole thing if anything goes wrong. Newly designed valves and submarine switches seem to have solved these problems. They still have some disadvantages which are inherent in the concept of the system. The area covered by the water is a circular one, but we farm fields which are square; this leaves dry corners, an area which amounts to 2.6 acres out of 40. The other drawback is getting enough water on a field quickly enough to warrant using the system on more than one field. Using the minimum of 200 gallons per minute for the 40 acre system and operating continuously, it takes slightly over three and a half days to lay down an inch of water per acre. Since corn and some other crops will use up to a third of an inch of water a day during peak consumption periods, this is not enough water to even keep up with the demand, let alone stockpile enough water to make it possible to pull the system off for another field. The need for perfectly flat fields, oddly enough, is not such a problem as most people imagine. The self-propelled irrigator will work well on gently rolling fields and land on which there is no more than a five per cent slope — that is, one of the powerful drive wheels can be five feet higher than the next without damaging the system.



With the conventional tow move, above, the lateral is towed across the main line with enough of a curve to bring it opposite the next outlet; then it is towed back. The oblique move, below, is done with castered wheels. The lateral is pulled at a 45-degree angle away from the main; the wheels are then pivoted and it is pulled back to the next setting.



Profit and Loss

The economic value of these three sytems, the tow line, the rolling pipe, and the automatic irrigator, depends on the labor each will save the farmer and its cost. If the wheeled systems are adapted to the fields on which they are used, they can save from 50 to 90 per cent of the labor. Cost is a different matter. A rule of thumb is that putting wheels under the pipe — whether in a tow line or a roll system — just about doubles the cost of the lateral.

The cost of an automatic system, as of

(Continued on page 83)

Home Mixed

Even in Low Price Periods Grain in the Bin Can be Turned into a Profit with Modern Feed Supplements and Efficient Management

AT THE TURN of the year, early in 1956, when hogs had hit their low mark on most markets—about $11.50—a farmer could feed his home-grown corn straight and make about 90 cents a bushel. He could increase the value of his corn by adding tankage and make $1.25 a bushel. Or he could grind his corn and mix it with a modern commercial supplement, fortified with the necessary minerals, vitamins, antibiotics, and unidentified growth factors, and feed it to make it worth $1.50 a bushel.

In 1953, the University of Minnesota ran controlled tests on five lots of littermate pigs on typical 1910 and 1953 rations. In 11 weeks the 1910 ration pigs had gained 55 pounds with a feed cost of $17.35; on the 1953 ration, 150 pounds with a feed cost of $10.

If you are feeding home grown grains one way to plan your feeding is to fit the grade of cattle to the feed you have on hand.

The University of Illinois made an even 50-year spread in their hog rations for their public demonstration last year.

The 1905 ration consisted of ground yellow corn and a mineral mixture (2 parts ground limestone, 2 parts steamed bone meal and 1 part trace mineralized salt) fed free choice in a self-feeder. The 1955 ration contained 87 per cent ground yellow corn, 10 per cent soybean oil meal, 1 per cent steamed bone meal, 1 per cent ground limestone, 0.5 per cent trace mineralized salt, 0.1 per cent B-vitamin premix 2-4-9-90, 0.1 per cent vitamin A and D concentrate (4000A-500D) and 0.3 per cent B12 and antibiotic supplement.

Two Hampshires and one crossbred were placed on each feed. Each group was housed in a 6 foot by 7½ foot house adjacent to a 7 foot by 14 foot concrete pen. Data were collected for a 48-day period.

Results of Illinois Demonstration

	1905 ration	1955 ration
No. of pigs	3	3
Av. initial wt., lb.	99.7	107.3
Av. final wt., lb.	140.7	215.7
Av. daily gain	0.85	2.26
Feed per lb. gain, lb.	4.85	3.59

The important point that the nutrition experts are trying to get to farmers is that they may think they are saving money by feeding just what they have in the grain bin, but that they make more money by using the modern formulas in times of low prices. Take a look at the Illinois results above. A farmer would have to feed nearly twice as many hogs—at a higher feed cost—to produce the same amount of pork to put on the market using the 1905 ration. It means he would have more labor, wear and tear on equipment and chance of death loss. In low price periods, the farmer has to nail the words "Most Efficient Production," up as the motto over the hog house.

Feed experts agree that the starting point for efficient hog gains is in the 2 to 8 weeks old period. Iowa tests show that the young squealer will gain a pound of body weight for every 1¼ to 2 pounds of feed. This is the time to give them the best bag feed you can buy; try to hold down your feed costs later. In the first two months is the time that modern rations, complete with antibiotics and vitamins and the unknown growth factors, can do their best work. The University of Missouri makes the point that 10 extra pounds of weight on pigs at weaning time will chop off 15 days from the time required to get them on the market. And that much of a time gain may put you in ahead of the marketing rush with prices that make you a nice profit.

Says S. W. Terrill of the Animal Science Department, University of Illinois: "Ready mixed rations are recommended for pigs up to 40 pounds in weight. A number of systems of raising and feeding pigs to a 40-pound weight are followed. Hog producers who leave the pigs on the sow until 5 to 6 weeks of age usually offer the suckling pigs a pig starter ration. Some use a highly palatable suckling pig prestarter (usually 20 to 22 per cent protein) to get the pigs eating well and then switch to a regular pig starter (usually 18 to 20 per cent protein.. Others use a regular starter throughout the suckling period.

"Hog producers who wean the pigs at 2 to 3 weeks of age (6 to 10 pounds) will usually feed them a well-fortified early weaning prestarter (usually 24 per cent protein) for at least one week before switching to a starter ration containing about 18 per cent protein.

Feeds

Relative Feed Values per Pound of Various Farm Grains			
	Dairy Cows	Fattening Beef Cattle	Fattening Hogs
Corn	100	100	100
Oats	95	85	85
Wheat	100	105	105
Barley	100	88	91
Sorghum	100	92	90

"One of the simplest ways to prepare a complete ration for hogs past weaning age is to mix ground grain with a good commercial drylot or pasture supplement. Some hog producers have successfully used a combination of shelled corn and pelleted supplement mixed by re-cycling through a feed unloading wagon. Below, right, mixtures of either ground corn or a combination of ground oats and corn are detailed. Formulas can be made up with either 35 to 40 per cent protein supplement to furnish the protein levels recommended."

Feeds For Beef Cattle

One of the smartest Midwest cattle feeders has an open mind on what kind of cattle he is going to buy and finish, until July 1st. Then he makes up his mind, based on his crop prospects. He says stocker and feeder cattle can be turned into more money if they fit your farm feed supplies. Good quality feeder cattle must be fed enough grain to finish them in the higher market grades. Low-grade animals can lose you money on a heavy grain program, but if you intend to rough them through the winter on corn cobs, corn stalks and other cheap roughage, they will fit into your program.

Here are the new recommendations from the Extension Service—at the University of Illinois for various types of cattle to fit a variety of farm grains and roughages:

Finishing Ration for Good to Choice Two-Year-Old Steers: Full feed in dry lot for 4 to 5 months. Feed 10 parts hammered or crushed corn to 1 part protein supplement (35 per cent protein, commercially mixed). Feed 6—8 lbs. of legume hay daily.

Right here a note should be added on stilbestrol about which so many farmers ask questions.

Stilbestrol is a synthetic chemical com-

(*Continued on page* 133)

Modern supplements require accurate weighing and thorough mixing. A farm feed mixer will last for years. Electricity takes the backache out of the mixing job.

COMPLETE HOG RATIONS USING GRAIN AND COMMERCIAL SUPPLEMENTS[1]

Protein content of ration, per cent[2]	18	14	12	10
	Pounds			
Mixtures of ground corn and 35 per cent protein supplement				
Ground yellow corn	1280	1580	1740	1890
Supplement (35 per cent protein)	720	420	260	110
Mixtures of ground corn and oats plus 35 per cent protein supplement				
Ground yellow corn	1000	1230	1350	1460
Ground oats	330	410	450	490
Supplement (35 per cent protein)	670	360	200	50
Mixtures of ground corn and 40 per cent protein supplement				
Ground yellow corn	1400	1650	1780	1900
Supplement (40 per cent protein)	600	350	220	100
Mixtures of ground corn and oats plus 40 per cent protein supplement				
Ground yellow corn	1080	1270	1370	1470
Ground oats	360	430	460	490
Supplement (40 per cent protein)	560	300	170	40

[1] Use a drylot supplement for pigs in drylot or on poor pasture; use a pasture supplement for pigs on good pasture. It is good practice to make a mineral mixture available to the pigs in addition to the mineral supplied in the supplement.

[2] 20 to 40 lb. pigs should be fed an 18 per cent protein ration, fed 2 lbs. a day, with 0.7 lbs. of supplement; 40 to 100 lb. pigs should be fed a 14 per cent protein ration, fed 3.8 lbs. per day, with 0.8 lbs. of supplement; 100 lbs. to market hogs should be fed a 12 per cent protein rdtion (10 per cent if on good pasture), fed 6.6 lbs. a day, with 0.8 lbs. of supplement.

Lynn Weigel of Broadacres Dairy, Powell, Tennessee, has a chance to watch cows in stanchions and in loose housing too. The photograph below shows a Broadacres loose housing layout.

Can the Dairy Farmer

CAN THE dairy farmer sell milk directly to the consumer and make the middleman's profit for himself? Here are the answers from two farm dairies.

Says Lynn Weigel of Broadacres Dairy, Powell, Tennessee, "I believe the way to make money in the milk business today is to build a big herd, say 400 cows, and stick to the job of producing feed, breeding the stock up, milking with the new labor-saving pipeline parlors, and dropping it into big bulk tanks for someone else to pick up and process. We're not doing it that way ourselves; we're selling to the consumer, but if I started over, it would be a wholesale operation."

Says J. C. Gorman of Cedarbrook Farms, Bellville, Ohio, "We are attempting to apply sound business methods to our dairying operations. We found that unless we entered the retail milk processing and delivery business, we would lose two ways: 1. Financially, we needed the processing profit to cushion the farming loss. 2. Only by selling our own dairy products could we enjoy the satisfaction of carrying into the homes and onto the tables of our customers, the superior products resulting from our modern herd and farming programs."

Both of these men are farming, producing, processing, and carrying the milk all the way to the housewife. One says he wouldn't go that far if he were starting over, one believes this is the only way. In their discussions about their dairy operations, they pinpoint the problems, advantages, and disadvantages that dairy farmers should know about before they go into what the economists call a "vertical operation," i. e., complete processing all the way from raw materials to the market.

Lynn Weigel tells the story of Broadacres Dairy, down in Tennessee: "Up to 1931," he says, "my father had been farming the 500 acres as a general farm with grain and beef cattle. The farm is just seven miles north of Knoxville in the second valley. It's a good location for a dairy and in that year we built a new barn and started in the dairy business, delivering milk in Knoxville. Both my brother and I went to the Ag. school of the University of Tennessee. Now the outside farm work is managed by my brother, and I take care of the office work. Both of us can work in the other's job, which makes it handy if one of us wants to get away for a few days.

"Knoxville has a population of about 400,000 and we have competition from Sealtest and Pet Milk. Right now, the fluid milk price is $5.05 for Class I milk, under our Federal Milk Order. We have some surplus in the spring, but all of our milk goes into Class I and II. We've been lucky to be in an area that has grown fast since we first started. Just twelve miles away, near the atomic laboratory, Oak Ridge has sprung up, and that's a complete city in itself. So we may not have the pastures or feed growing possibilities like dairymen have up North, but we do have a growing market.

"We farm 500 acres: 80 acres is in corn and orange cane for silage; 90 acres is in alfalfa; and the rest is in pasture. We can store 1400 tons of silage in our seven upright silos and we would like to have more capacity. I like the size of the Martin Jumbo silo; one of those would make it possible for us to feed silage every day of the year. We use Starline silage feeders, which are like silo-cleaners running in reverse. With silo unloaders, this makes an almost automatic operation. Trench silos are too messy for us. We make a showplace out of our farm and we don't want any of the smell or juice of a trench silo to greet groups of visitors when they come here.

J. C. Gorman of Cedarbrook Farms, Bellville, Ohio, with the paved yard of the farm's loose housing set-up behind him. The hay drier is in the center of the photograph.

cut out the Middleman?

Our advertising is built around the slogan, "Fresh From the Farm." We feel a good part of our success is from putting that idea across.

"We don't raise any grain. Our dairy mixture is delivered by a Knoxville feed mill in a bulk truck and blown into the loft above the milking parlor. We are using an 18 per cent protein feed in the winter and this is dropped a little in the summer. From the grain storage bin in the loft, it is augered out to the chutes above each milking pit with the same kind of auger equipment that is used to stoke furnaces. Each cow gets one pound of grain to start with, then at milking time another pound for each ten pounds of milk she gives. Our grain is costing us $68 a ton at this time.

"As we expanded from our original stanchion barn we decided to go into loose housing. Our cows are healthier in the open air and if you go out in the roofed area at night, you'll find them warm and content on the sawdust bedding we use. Our total cow herd is 300 now and we are milking 200 of them. Half of them are Guernseys and half are Holstein. It takes seven men to handle the cattle in the winter and one or two less in the summer.

"Three men do the milking in the three pits of the Starline engineered milking parlor. Each man has four cows to handle. He washes up two cows while the other two have the milking machines on them. The gates open with a pull of a rope to let the cows in and we let the first two cows out with the pull of another rope. We can milk 90 cows an hour with our three-pit parlor.

"From the DeLaval milking machines the milk goes directly into glass lines to a Creamery Package bulk tank which holds 800 gallons of milk. This holds two milkings. We have C.I.P. cleaning, using a double line."

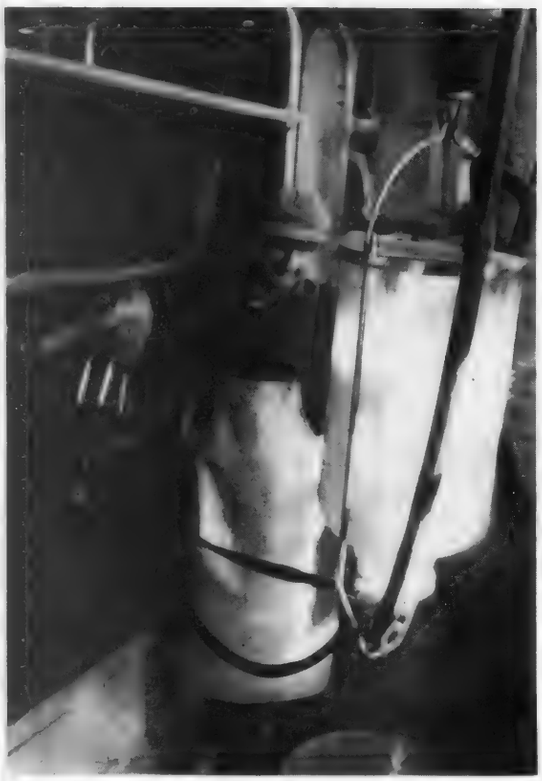
The Broadacres pasture program is based on the use of concentrated straight fertilizers in a Gandy spreader. Every pasture is given a soil test each year and the necessary fertilizer is applied. Several loads of manure go on the pasture every day after the loose house areas are cleaned. Two hundred acres are irrigated with a pump powered with a 100 h. p. electric motor. The back acreage is high and rolling and Weigel expects to put in a booster pump to get the water up to it. Three miles of aluminum pipe is used to apply water during the dry periods. If the silage corn and cane needs water during the critical period, the pipe is moved into it. Four wheel tractors and a crawler are used to farm the 500 acres and 5 men handle the operation. These men live on the farm.

Delivering the Milk

The dairy processing plant and delivery trucks are operated by unionized employees. A fleet of 22 trucks delivers the milk to the Knoxville area; these trucks have built-in refrigeration plates which are filled with a calcium chloride solution. Every afternoon after they return from their delivery runs they are hooked up like a line of horses to a pipeline leading from a central refrigeration plant. A bank of ice is built in each truck which lasts through the delivery run.

The dairy processing plant at Broadacres is as modern as that of any of the national-dairy-chain competitors and enables it to compete quality-wise with the best of them. The Weigels have worked their slogan, "Fresh From the Farm", in fact, as well as in their advertising, which incidentally, boasts even a television show, "Stars of the Grand Old Opry." This morning's milk is on the housewife's doorstep tomorrow morning.

Two stainless steel holding tanks form



Automation at the Broadacres Dairy comes in the form of a 3-pit pipeline milking set-up (above) with C.I.P. cleaning. (Right) Buying milk from other farm producers means you have to test their milk for butterfat on a regular schedule.

one wall of the processing room, one a 2,000 gallon and the other 3,000 gallons.

A Cherry-Burrell Vacreator takes any feed odor out of the milk and a flash pasteurizer does the pasteurizing in a matter of seconds at 165 degrees Fahrenheit. The milk is packaged in paper containers in a Sealright leased machine. Cream is bottled in glass with a Standard machine using double caps. Two big batch pasteurizers are used to pasteurize buttermilk. The demand is growing for half-gallon packages of milk and these, along with the quarts and cream in bottles, makes the plant run over 25,000 units a day. Sixty-seven other local dairy farms also produce for the Broadacres plant, delivering their milk in cans.

Lynn Weigel estimates that a dairy plant should break down the production costs on a plant like Broadacres (which he admits has to have more polish than most, because of the advertising value for visitors) as allowing 7 cents for delivery, 5 cents for processing and the balance of the 22-cent delivered price for the farm and profit margin. "To replace our plant, and that includes our ice cream plant, would cost $300,000," he says.

The methods the Weigels have introduced to intensified dairying make use of every new idea that comes along to push production per cow and per man up to the point where there is a profit at every step along the vertical diversification ladder. And over the 25 years of operation, it has paid off for Broadacres Dairy!

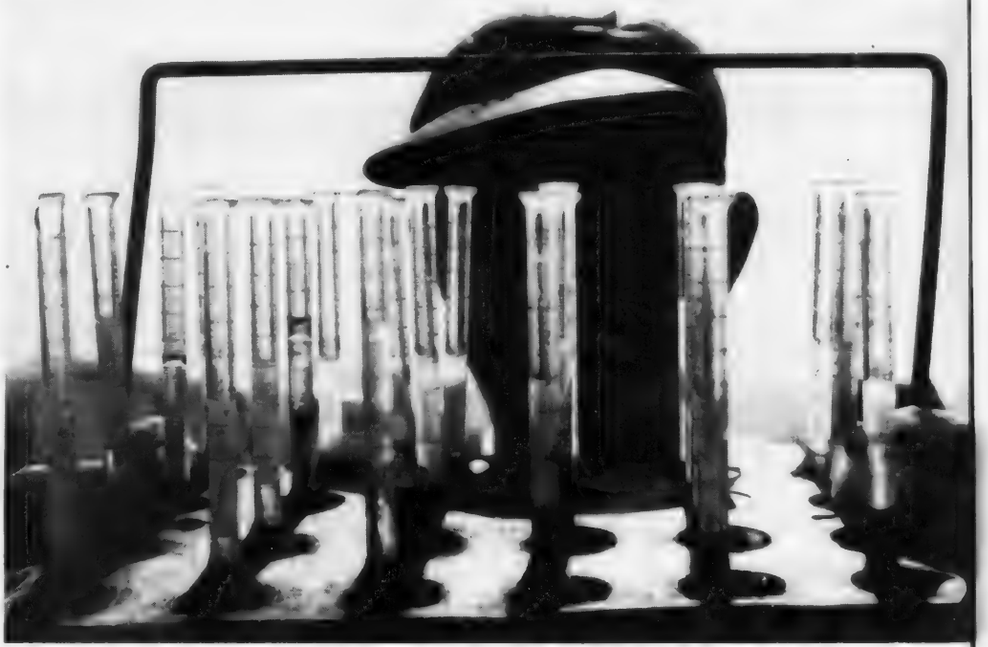
J. C. Gorman's Cedarbrook Farm at Bellville, Ohio, is only a short flight for a crow over the hills from Malabar Farm. It's the same kind of gravel underlayed valley land that the late Louis Bromfield liked to bring into abundant grass production. With plenty of manure and fertilizer, helped by good yearly rainfall and a sprinkler irrigation system that can pump a rain out of a big dug-well or a stream, the two big bunker silos, one holding 300 tons and another 450 tons, can be filled easily out of the 300 acres of grass and 50 acres of corn. There is a big 80-ton hay drier powered by a 42-inch fan that can dry and fill up several storage barns during the season with high quality alfalfa hay. And Cedarbrook raises its own grain.

Cedarbrook is a Youngster

Cedarbrook started delivering milk to Mansfield housewives in 1951. The metropolitan area of the city is about 75,000 and, like every other city, there is tough competition from chains and local dairies. There are Borden's, Isaly's, and Page's in the local picture. The "plus" that Gorman has to offer is the quality and flavor of fresh Golden Guernsey milk. "Our advertising is mostly the kind one cannot buy," says Gorman, "one housewife tells another that the kids will ask for milk to drink now that they have ours in the refrigerator."

Says Gorman, "Any dairy farmer considering entering the retail milk business should consider the reasons which impelled Cedarbrook to provide complete loose housing for its Guernsey herd.

"Our costs two years ago with 45 milking head and stanchion-type barns ran above $5 per 100 pounds of milk ready for the pasteurizers. When the lower milk prices started to pinch, we could see we had to cut costs and suddenly. We did this two ways: with more efficiency per man; with more production per cow. We spent $14,400 to put in a paved barnyard and loose housing system that was worked out by Doane Agricultural Service, using many of the ideas of Professor S. A. Witzel of Agricultural Engineering at the University of Wisconsin. There are 15,600 feet in the layout, two aluminum covered pole barns, 40 by 75 feet, each of which will house 50 cows. With the hay drier, which is located in the center of the barnyard, and the two adjoining trench silos and outdoor drinking fountains, we have increased our efficiency per man. We now have 3 men handling the herd rather than 4½ to 5 we had formerly. The milking herd is up to 81 cows. We plan to go to a 100 milking cow unit before the year is over. That means that we will cut our cost of milk production to somewhere between $2.50 and $3.00 per hundred.



The Broadacres processing plant packages with automatic machines and pushes the slogan, "Fresh From The Farm," on every paper carton and glass bottle.

By the time the herdsman's daughters are walking down to meet the school bus the morning milking is done and the Broadacres delivery trucks are covering Knoxville.

"We can't afford to take an income that figures 40 to 50 cents an hour for the time of our good dairymen and the average dairy farmer can't afford to take that for his time either. Yet with a national average for dairy cows under 6000 pounds, that is what the dairy farmer is ending up with. So we have aimed at a high-producing herd."

To get more milk per cow, the Cedarbrook culling program has been made tough and rigid. There are no more pets "who might do better the next time." In five years, 103 cows have been sent to the butcher. The heifer who hasn't made a 305C2X (305 days test, carrying a calf, milked twice a day) average of 8000 pounds at the end of two lactations, is out of the herd, unless she has been sick during the milking period. The good results of this program are evident when you see milking sheets; there are 35 cows with a 10,000 pound, or better average.

The two-pit milking parlor is equipped with a DeLaval pipeline system that drops the milk in a 700-gallon Dari-Kool bulk tank. The entire glass pipeline and the milking machines are cleaned-in-place after milking.

The Processing Plant

The pasteurizing and bottling equipment at Cedarbrook Farm is in a separate building. Virgil Crunkilton, the farm and dairy manager, has kept an accurate record of the costs of equipment that went into the processing plant. "The first thing that you need for a pasteurizing plant," says Crunkilton, "is a good well and a good pump. Ours is a 6-inch well, 39 feet deep with a 1½ h. p. Myers jet pump that throws 1200 gallons an hour. The next thing you need is the Board of Health's approval of your water and everything you plan to do. They can give you a copy of their local code for dairy plants and how they intend to interpret it. They should approve any building plans and any equipment you buy—before you buy it. The main pieces of equipment we bought for our dairy plant were as follows:

Bottle washer, Creamery Package
Pasteurizer 150 gal., Steriline
Pasteurizer 200 gal., Pfaudler
Homogenizer, Martin Gaulin
Aerator Cooler, Cherry-Burrell
Bottler, Specialty Brass
Capper, Midwest
Separator, DeLaval Dairy Type
Thermometers, Taylor
Boiler and Oil Burner (12½ h.p.)
Cheese Tank, Girton

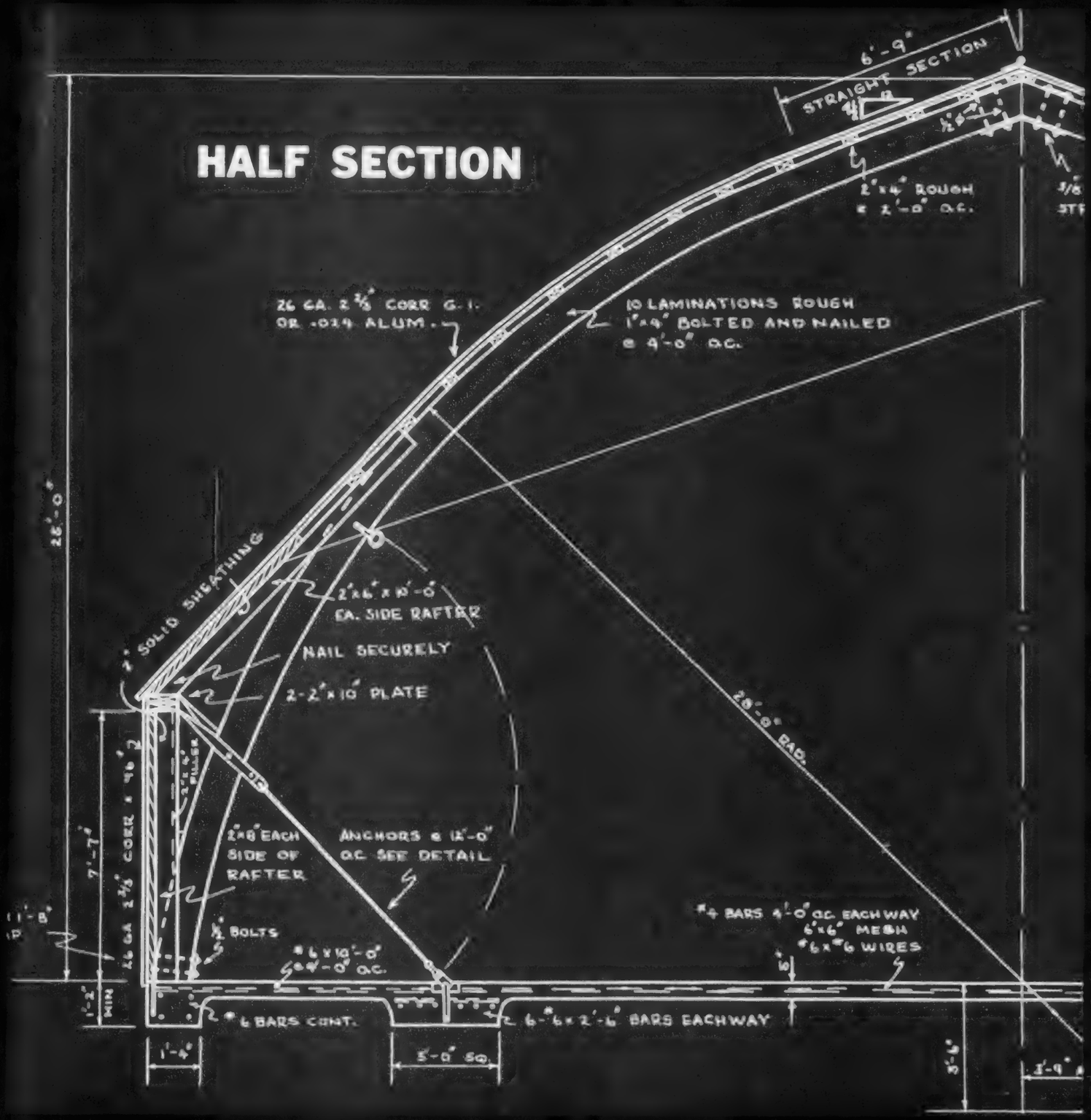
(Continued on page 87)

BUILDINGS for next-to-nothing

The arched roof, home-made rafters, and sturdy grain-box base frame this low-cost aluminum covered building. Movable anchors tie walls and rafters to the slab.

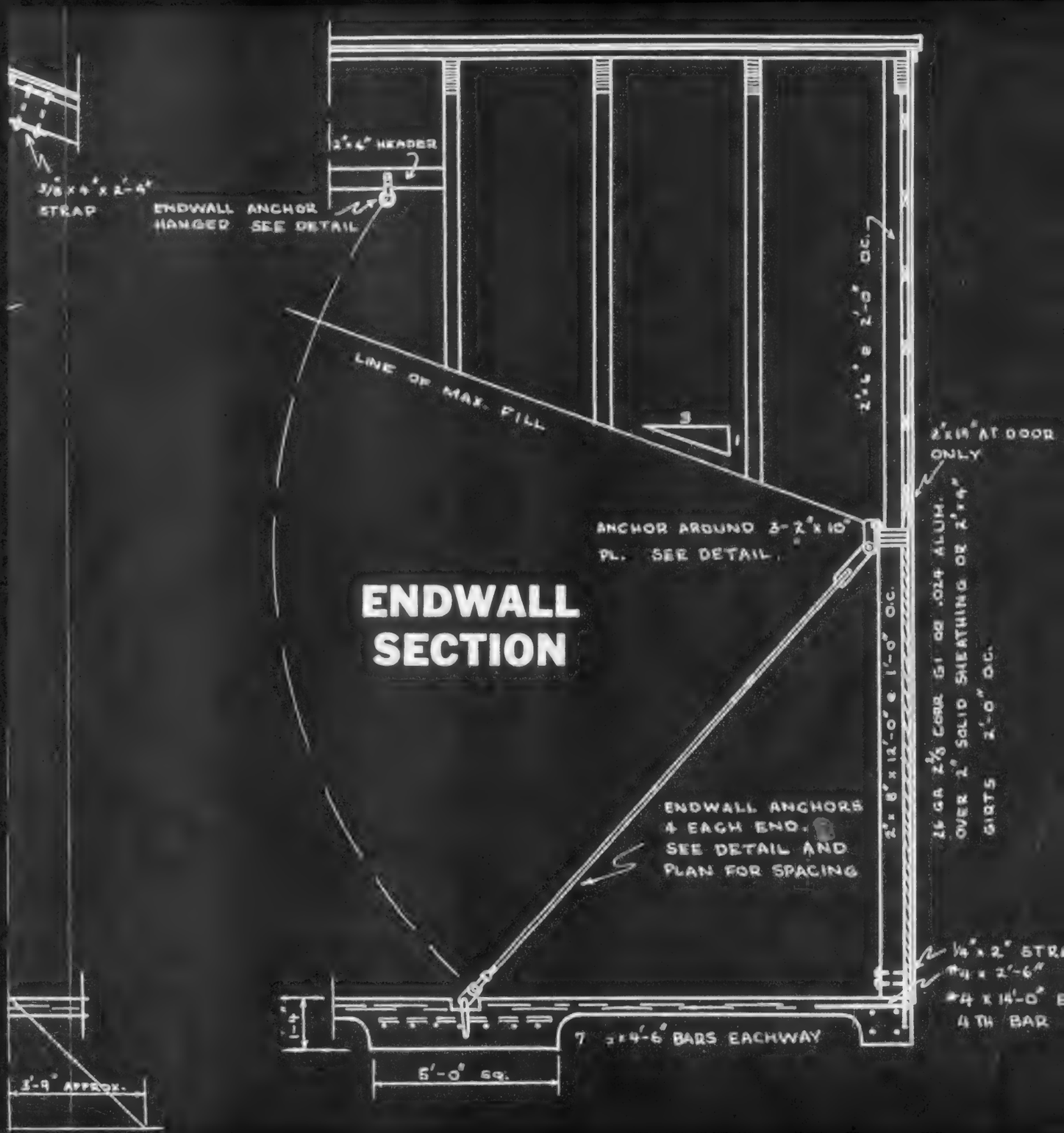
THE MAN who says you can't get something for nothing should take a look at the grain and implement storage buildings owned by four Iowa farmers which come about as close to being outright gifts as you can get. The giver—the government, who else?—is making this bargain deal in order to put more grain storage space on American farms. Right now the government will loan most of the money it takes to put up the building and then turn right around and help pay off the loan in record time. And it looks as though they will go right on helping farmers put up buildings as long as we continue to pile up surpluses.

Teamwork between two government departments is what does the trick. The Agricultural Stabilization and Conservation Committee loans the farmer up to 80 per cent of the cost of the storage building to be constructed. With adequate storage, the Commodity Stabilization Service is willing to grant a loan on corn that gives the farmer 20 to 30 cents a bushel more than he would get on the open market—with wheat, the loan includes 10 to 15 cents a bushel extra for storing. At the end of the first year, in parts of the country where it is safe to store grain for more than one year, the Commodity Stabilization Service may reseal the grain and pay the farmer 15 cents a bushel storage for the second



Grain Storage Building designed by Norval H. Curry

This low-cost grain storage building is composed of a gracefully arched roof which covers what is actually a huge, heavily built grain box. The concentrated load of the stored grain is borne by the straight-sided box; the greatest burden ever borne by the curved ribs, which form the roof, is the wind load. The plan above shows the relationship of the roof to the side wall. The framing for the side wall is formed by 2 by 8's, one on each side of each rafter. These 2 by 8's as well as the rafters are anchored at the base to the slab and, at every fourth rafter, a second anchor is provided by a tie rod. The side walls as well as the framing that ties the wall back into the curve of the roof are sheathed with two-inch thick planks.


2"x4" HEADER
3/8"x4"x2'-4" STRAP
ENDWALL ANCHOR HANGER SEE DETAIL
LINE OF MAX. FILL
3
1
2"x8" @ 2'-0" O.C.
2"x10" AT DOOR ONLY
ANCHOR AROUND 3-2"x10" PL. SEE DETAIL.
ENDWALL SECTION
2"x 8"x12'-0" @ 1'-0" O.C.
26 GA Z/S CQQR GI OR .024 ALUM. OVER 2" SOLID SHEATHING OR 2"x4" GIRTS 2'-0" O.C.
ENDWALL ANCHORS 4 EACH END. SEE DETAIL AND PLAN FOR SPACING
1/4"x2" STR
#4 x 2'-6"
#4 x 14'-0"
4TH BAR
7 #4x4'-6" BARS EACHWAY
5'-0" sq.
3'-9" APPROX.

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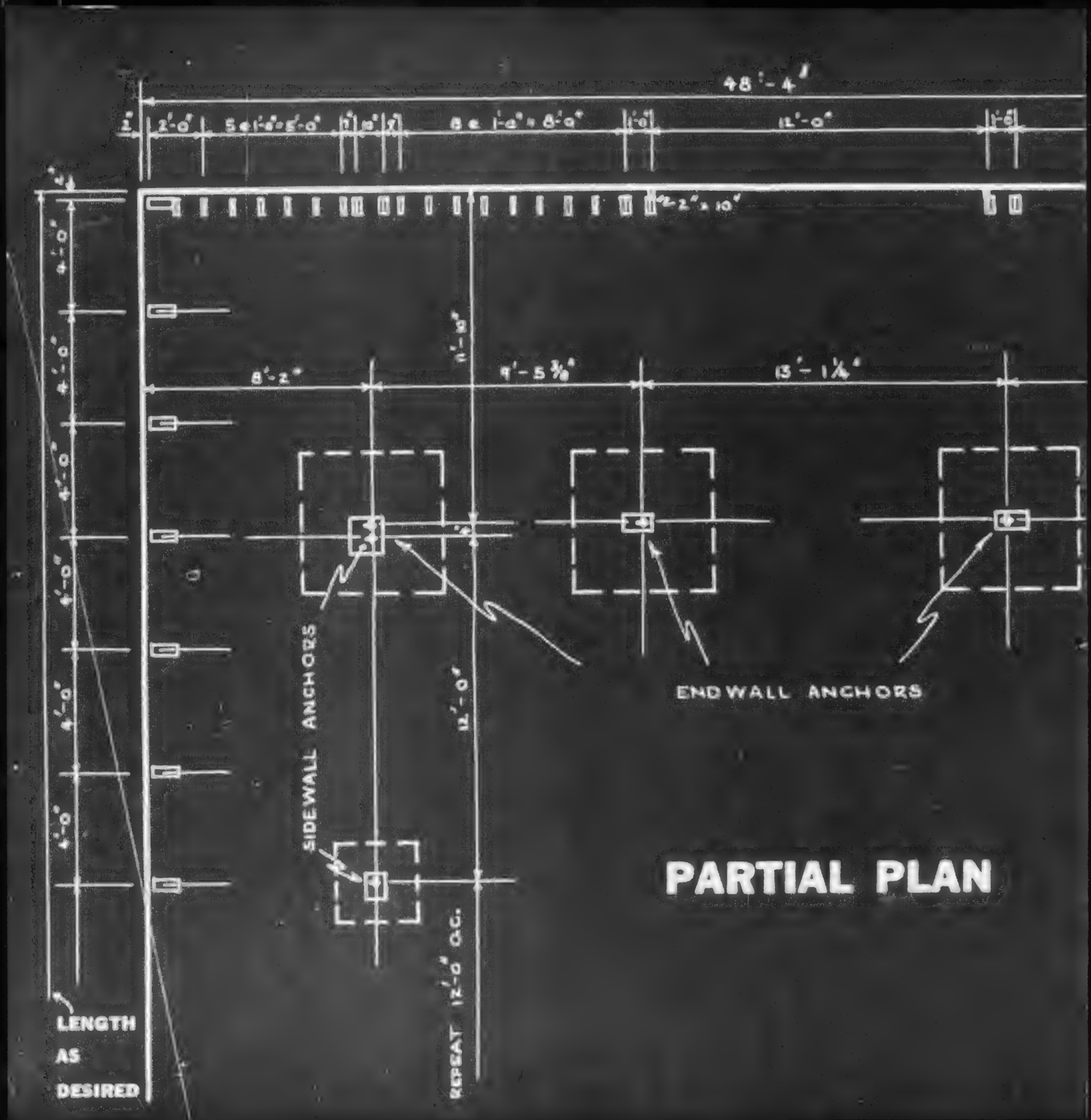
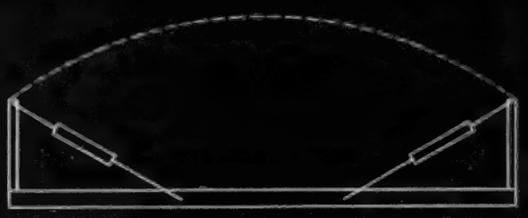
The end wall, like the side walls, must be built to bear the load of the grain. Its sides are planked, its base anchored to the concrete slab and the upper part of the wall strengthened against the outward thrust of the grain by steel tie rods which can be disconnected and swung up out of the way when the building is empty. The detail drawings of these tie anchors are on page four of this pull-out; their location on the end wall and along the side walls is shown in the partial plan on page three. These rods and the framing are arranged so that a 12 foot door space is left in the center of the wall. The rear wall is pierced at the floor level with two openings for the ventilating fans, which draw air through the grain through sectional air ducts.

The half-rafters are built on a 28 foot radius, as shown in the lower right corner of the drawing on page one; a pair of them cover a span of 48 feet 4 inches, which is the width of the building. The length is optional — buildings varying from 40 to 180 feet long have been built. The height is 25 feet at the center. A slight peak is given the roof by keeping the last 6 feet 9 inches of the rafter straight.

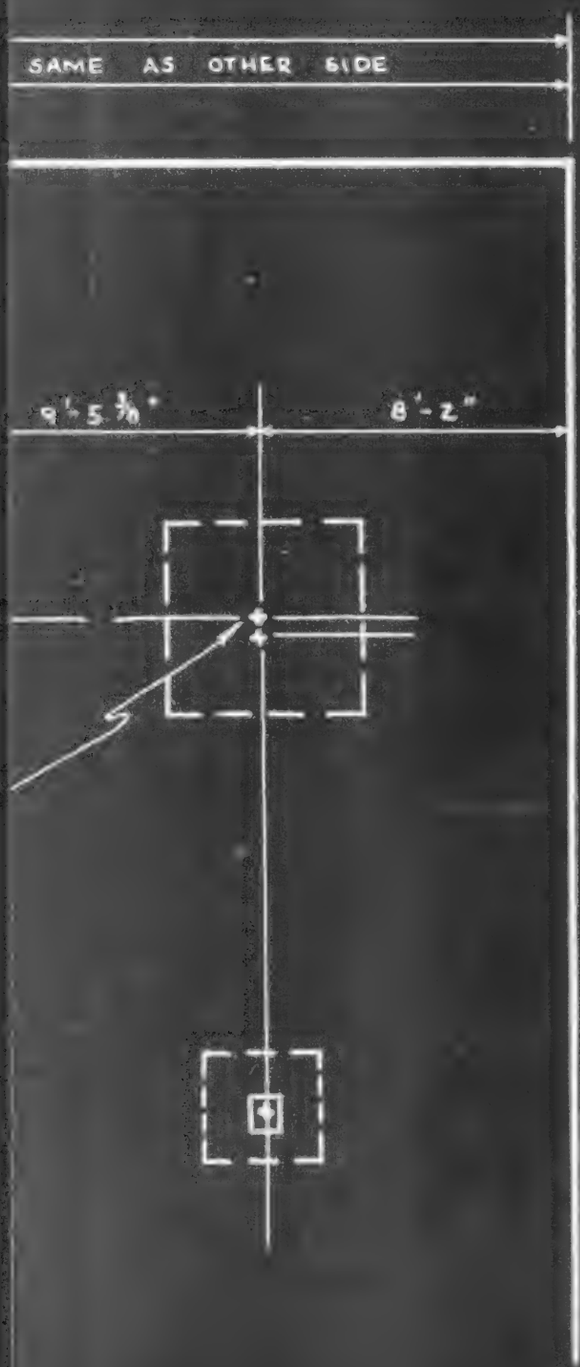


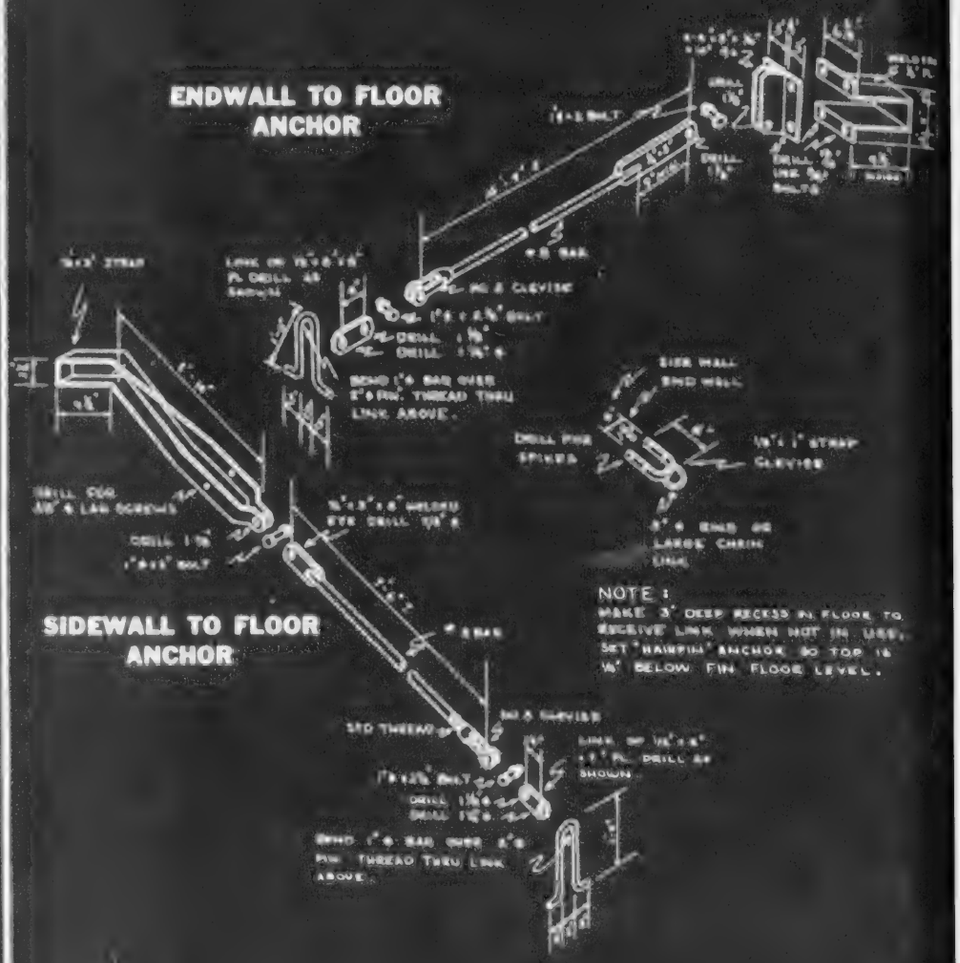
PULL OUT

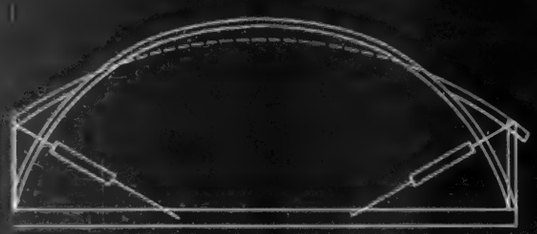


1 THIS IS AN ECONOMICAL CONTAINER FOR GRAIN.

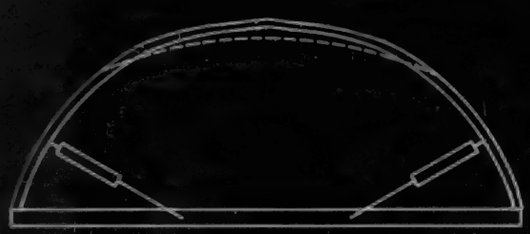
2 THIS IS AN ECONOMICAL ROOF




ENDWALL TO FLOOR ANCHOR
SIDEWALL TO FLOOR ANCHOR
NOTE:
MAKE 3" DEEP RECESS IN FLOOR TO RECEIVE LINK WHEN NOT IN USE. SET "HAIRPIN" ANCHOR SO TOP IS 1/4" BELOW FIN FLOOR LEVEL.



5. THIS IS AN ECONOMICAL ROOF ON AN ECONOMICAL CONTAINER.
THE ROOF CARRIES NO PRESSURE FROM THE GRAIN - RIBS CAN BE COMPARATIVELY LIGHT.



4. THESE SIDES CARRY GRAIN PRESSURE. RIBS MUST BE FAR HEAVIER AND SPECIAL PROVISIONS MADE IN RIB FOR CONNECTION OF TIE ROD. OK FOR PREFABRICATION, BUT NO JOB FOR SITE CONSTRUCTION BY AMATEURS

year. Finally, just to put an egg in the beer, the Bureau of Internal Revenue will permit the farmer to write off the cost of the building from his taxes over a period of five years. This all adds up to the closet thing to a gift since the soldier's bonus.

When Jake Bell, a Coon Rapids, Iowa, farmer, began talking over this happy situation with some of his neighbors in the summer of 1955, he found that one of them, Steve Garst, had a set of plans worked out by Garst and Norval Curry, an agricultural engineer at Iowa State College, for a storage building that could be built by common labor at a cost of around 20 cents a bushel of grain stored. Bell was most definitely interested. He studied the plans and found that the building would be a good permanent structure 48 feet wide and as long as a person cared to make it. With no internal supports the building offered great unobstructed floor space which made it ideal for machine-handling the grain, or for machinery storage; or it could be converted into a livestock building.

"When I digested those building plans," Bell said, "I compared them with my old method of storage, which was to heap ear corn into temporary storage structures made of snow fencing. Then I figured what such a building would actually cost me and I decided that the only thing wrong with the proposition was that I hadn't built it last year."

Bell, Steve Garst, and another neighbor, Dale McCarty, all decided to build. As an efficiency measure, they decided that part of the work on each of the buildings could be done cooperatively.

Bell's problem was complicated by the fact that, though he owns 240 acres of rolling land that is in temporary pasture, most of his farming operation is concentrated on rented land, a 450 acre piece owned by a lawyer and 200 adjoining acres that Bell rents from his father. His landlords agreed to pay him the 10 cents a bushel storage charge they had been paying for commercial storage and Bell decided to go ahead and put up the building himself.

The hitch was that the best location for the building was somewhere near the center of his rented land, and the government refuses to make a loan for the construction of a permanent storage building unless the farmer has clear title to the land on which the building is located. Bell's father solved this problem by giving him one acre of land located on the farm lane where he would have free access to it. Much this same solution is often worked out on mortgaged land—the bank or insurance company grants clear title to one acre of land in order to let the farmer take advantage of the government's bounteous storage policy.

With the building site secured, Bell took his problem to the Agricultural Stabilization and Conservation County Committee

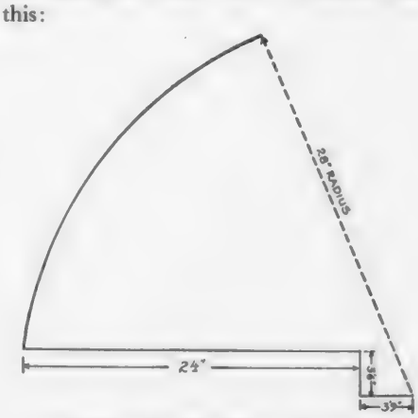
Ed Reid's steel building was erected on the farm by the dealer who sold it. Eighty per cent of the cost of this building was loaned to Reid by the County Agricultural Stabilization and Conservation Committee. He'll pay for it in two years with the money he saves on sealing his corn, on resealing last year's crop, and on tax write-off.

to ask for a loan. "I figured that with 385 acres in corn and 215 in grain sorghum, I ought to plan on around 40,000 bushels of storage space. Just to play it safe, I told the A.S.C. that I hoped to build it for 25 cents a bushel and asked for a loan of $8,000, which was 80 per cent of the full cost. I remember one of the committeemen saying he would recommend the loan, but he didn't think I'd ever build her for that. Actually, the building cost me $7,600, so we only borrowed $6,000. At that price we spent only 19 cents a bushel and we kept track of every penny spent. Incidentally, I would recommend to any farmer who is planning such a project that he keep track of all costs, including full credit for his own and his hired labor—he'll want every penny of legitimate cost recorded when it comes to charging off the building on his taxes."

The building that Bell and his neighbors put together is shaped something like a loaf of home-made bread. It has short straight sides and a rounded roof that rises to a slight peak. The skeleton of the building is formed of arched rafters 48 feet wide and 26 feet high, which are anchored at four foot intervals to a concrete slab. The straight sides, which actually hold the grain, are achieved by nailing straight two-by-eights to the side of each symmetrically curved rafter. These sides are held vertical by tie rods extending diagonally from plate to floor. The sides are solidly sheathed with two-inch-thick rough lumber to a height of 14 feet above the floor level—which is as high as grain is heaped; above this point the rafters are tied together with two-by-fours spaced on two foot centers. The whole structure is covered with a shining skin of corrugated aluminum.

The great wooden ribs of the building, the arched rafters, are the key to the whole structure. The cheapness and ease with which unskilled labor can make these members is the answer to why the building can be built for less than 20 cents a bushel of storage space.

For the rafter making job, Bell, McCarty, and Garst agreed to pool their labor and do all of the rafters for all three buildings at one time. First they made a jig on which to build and shape the rafters. To get their arc, they marked off a line 24 feet long; from this they dropped a second line 3 feet 6 inches at right angles to the first and then drew a third line at right angles to the second, which was 3 feet 9 inches long; a string from this point to the end of the 24 foot line gave them the radius for their arc. It looked like this:



In building the jig the arc was followed up to the last 6 foot 9 inches; this was left straight in order to give the roof a

(*Continued on page* 93)

By John H. Durrell

The Moon and Andy

WHEN Andy Neufarth came to work for us twenty-five years ago, we knew we were getting a good man, but we didn't know we were getting the moon, too.

From that day until he retired, almost everything here on the farm from planting to repairing roofs was done according to the phases of the moon and the signs of the zodiac.

Andy offered no sympathy when jobs we'd hurried him into doing at the wrong time—like the fence posts that the frost heaved out of the ground—didn't work out.

"Done it in the wrong sign," he'd say. "Set 'em right and they'd of stayed down."

Besides the moon, Andy believes in good soil, good tiles, gates that swing freely, good fences and tight buildings. He shows his German descent in his thoroughness and the way he holds on to his belief that a farmer should keep one eye always on the moon.

Andy is past 70 but his stocky legs are still good and he eats three square meals a day. When he grins, his tanned face puckers up around the bulge made by his cud of tobacco. His working uniform is a battered felt hat, a denim shirt and jeans held up by police and fireman suspenders. Rust marks measure the moves the buckles have made as the elastic stretched.

Andy's attitude toward planting by the moon is as unchanging as the trademark on his suspenders. Here on the farm we always went along with it, because somehow he and the moon turned out good crops and the posts he set under the right sign stayed in the ground.

Andy was not just another moon planter. He often disagreed with the cult, and for very good reasons too. Most moon farmers plant corn and other crops which bear above ground when the moon is waxing, but not Andy.

"That's fine," he said, "but I'm raising corn, not silage. Corn planted when the moon is filling will ear out two joints higher than corn planted when the moon is waning." He planted in a waning moon, and the picker did a better job with the ears lower on the stalk.

"Stuff like melons and cucumbers are different," he explained. "You plant them in the wrong of the moon and they just bloom, bloom, bloom, and you get nary a pickle."

Potatoes and other crops which bear below the ground should be planted in the dark of the moon. "Otherwise," Andy says, "the crop will work to the surface and turn green from sunburn."

"Some fellows have it figured to the day," he says. "When I was living near Brecon, Dan Denman used to work his ground up and then let it lie. But some morning you'd look out and the whole family would be planting potatoes. The sign was just right."

Claiming that farming by the moon will work and proving it are two different things. Andy's prize exhibit is a fence along the lane that runs behind the barn.

He and his son-in-law set those fence posts, steel posts at that, in the light, the waxing of the moon. Each frost has lifted them a little higher until the bottom wire is now a good eight inches off the ground.

Shingles are the same. When Andy sees a roof where the shingles have buckled he'll tell you: "They should have put on those shingles in the dark of the moon. If they had they'd lay flat forever."

While the moon is the big wheel in Andy's farming operations, the twelve signs of the zodiac govern certain minor activities, like castrating livestock. "When I was a boy on my father's farm," he says, "my uncle who had the next farm came over one day to help with a male hog we had to cut. Four hours after we'd finished with him, he was dead and stiff. We had cut him when the sign was in the heart."

"This sort of surgery should be done when the sign of the zodiac is between the thighs and the feet," Andy says. "Otherwise, you stand to lose your stock."

(*Continued on page* 136)

Farmers like Andy Neufarth (opposite page) rely on these 12 signs of the [illegible] for t[illegible]s. Whatever it is, it works! Around this page are the twelve symbols of the Zodiac, passed down from the Middle Ages. They are identified with the heavenly constellations predominant at different times of the year. Reading clockwise: Aquarius, the water-bearer, January; Pisces, the fishes, February; Aries, the ram, March; Taurus, the bull, April; Gemini, the twins, May; Cancer, the crab, June; Leo, the lion, July; Virgo, the virgin, August; Libra, the scales, September; Scorpio, the scorpion, October; Sagitarrius, the archer, November; Capricornus, the goat, December.

CAN

THIS SPRING, several thousand dairy farmers in the Detroit milk-shed pulled a walkout that cut the city's milk supply to a trickle. While the farmers showed that no group has a monopoly on the ability to organize a strike, they left the question of the wisdom of a farmer strike wide open.

The strike started on Monday, March 26, when some 700 farmers fed their milk to pigs or dumped it and began picketing three of the largest dairies in Detroit. Detroit newspapers, which are connoisseurs of strikes, commented on the orderliness and lack of violence. By the end of the week, the picket lines were scattered over several thousand square miles of eastern Michigan; roving bands of picket cars patrolled the highways, swooping down on loaded milk trucks and turning them back or dumping the milk: even convoys of several trucks were stopped and diverted to processing plants or dumped. Labor leaders who are used to picketing a few yards of factory gate were amazed at the ability of the farmers to cover a whole section of the State.

Whether or not farmers can use the weapon of industrial labor, the strike, is puzzling thoughtful men. They know that in every strike there is potential violence, and they dread to see this carried to the peaceful countryside. Organizing and bargaining is one way farmers can help themselves--- but can they accomplish this without racketeering and violence?

By Grant Cannon

FARMERS STRIKE?

Behind this strike is a situation that is similar to that in other milk market areas. Detroit, which consumes from a million and a half to two million quarts of milk a day, is supplied with milk by some 16,000 farmers scattered from the Ohio border up into the thumb area formed by Saginaw Bay and Lake Huron. The milk is marketed by the farmer's cooperative, the 40-year-old Michigan Milk Producers' Association, which operates collection stations, routes the milk to distributors in Detroit and nearby cities, and runs processing plants of its own to handle surplus milk. The M.M.P.A., as the association is usually called, also represents the farmers in price matters. Its officers appear and argue the farmers' demands before a hearing officer of the U. S. Department of Agriculture in order to get an advantageous milk order for its members. Its committees also bargain with the local distributors in an effort to improve on the minimum price set by the milk order.

In spite of its bargaining efforts, the M.M.P.A. was unable to stop the slump in milk prices that has been going on since 1952. As prices slid beyond the point of reasonable return on the farmer's investment and labor, the Association members became restive. A number of different schemes for improving the situation were suggested, but still prices deteriorated. In the fall of 1955, a group of farmers around South Lyon got together and decided that what was really needed was tougher collective bargaining with the dairies—bargaining that would carry with it the threat of a strike if conditions were not improved.

At first, this militant group considered itself a gadfly within the M.M.P.A., pushing the Association to take a tougher stand. Later, they decided that they should form a separate group with the sole function of bargaining for the price of milk—the other functions of the M.M.P.A., collection, distribution, and processing, they would leave to the Association to continue. Their decision was reached after their plan of action had been rejected by the Association price committee. They urged the dairy farmers of Eastern Michigan to continue their membership in the M.M.P.A. and also to sign up with the new organization, which they called the Fair Share Bargaining Association.

As the Fair Share organizing drive picked up steam, the M.M.P.A. began stirring itself. For months it had refused to bargain about milk prices because a federal grand jury was investigating it and some of the dairies on an anti-trust charge. Now, though the grand jury continued to investigate, it resumed bargaining for an increase in the $4.41 price for 100 pounds of Class I milk containing 3.5 per cent butter fat. The distributors, too, were perfectly aware that a new and rougher organization was in the making and rumors began to spread that the distributors would grant a raise in price.

Now the squeeze was on Fair Share—if the M.M.P.A. secured a substantial raise in price, their organizing would collapse—and on March 26, two days before the M.M.P.A. was to hold a meeting of all farmer delegates, they struck. The strike was called to try for an even greater increase in price and also to prevent the destruction of the Fair Share organization

from taking place when the M.M.P.A. stole their thunder by getting the raise they were demanding.

"When we called the strike," Rolland Brengle, Chairman of the Fair Share group, said, "I told the papers that we might have as many as two hundred farmers out picketing—and I was afraid that I was being too optimistic. The next day I was floored at the turn-out.

"The strike itself was tough on all of us. One of the roughest things I had to do was to get up in the morning and milk and then dump all that milk down the drain. You know milk is harder to get rid of than you'd think—if you dump it in the yard it gets to stinking. I poured it down the milk-house drain, but it wouldn't go down fast enough and eddied under the cooler. So, besides losing all the milk, I had to do an extra clean-up job. In spite of the pain of dumping good milk, most of our members poured it out or fed it to hogs. Then we went out and picketed the dairies and tried to stop the trucks from bringing the milk in.

The strikers fed their cows, milked them, and then poured the milk into the ditch — or fed it to hogs if they had hogs. Then they gathered for instructions from the strike leaders, and went to the picket lines.

"Our members figured out ways to stop the trucks. Even when a convoy of them was led by a sheriff's car, they stopped them. They'd park along the road by a stop light; when the Sheriff drove up, he'd stop and then go on. The minute he drove on one of our boys would drive his car in front of the convoy and jump out and talk to the truck drivers and urge them to turn around and drive back. The Sheriff would get a block away and discover he had no trucks behind him; he'd come back, but by that time the milk haulers would have been convinced that they could help themselves as well as the farmers by going back. The drivers had an interest in this situation—they know that at the prices we get we just can't afford to pay any more for hauling and we made it clear that we felt they needed a raise, too, and that if we got one, so would they."

The Detroit newspapers gave the strike the same coverage they gave to Grace Kelly's marriage; this brought the plight of the farmers to the attention of city people. One paper interviewed a number of farm women who were picketing. One of the pickets said, "Last year I figured out that my husband earned from 10 to 20 cents an hour, 16 hours a day, every day of the week." Another picketing farm woman said: "They talk about how they pay $4.41 a hundredweight, but the most I've ever seen is $4.23. They decide how much they buy at base and how much is surplus—but the surplus milk is just as good as the base and costs us just as much to produce. We get along on the income produced by 30 cows only because we are postponing repairs to machinery, a roof on the barn, furniture in the house, and clothes on our backs."

"You really learn a lot about your neighbors during a strike," Brengle said. "One of our members, a dignified gent in his sixties, who is an internationally known purebred breeder and a pillar of church and community, got arrested for throwing rocks at a milk truck and went right out and did it again. And one of our association leaders who spent every day on the picket line, was found to be quietly shipping his own milk into a small dairy during the whole strike. One thing we learned for sure, farmers can and will fight for their rights even if it means striking."

The strike lasted from Monday of one week until Tuesday of the next. It ended when the M.M.P.A. secured an agreement from the distributors that they would pay $5.00 a hundred for Class I milk. They also got an injunction against the Fair Share group to prevent further picketing. On the fifth and sixth days of the strike the milk flow into Detroit was cut to 20 per cent of normal, milk rationing was in effect, and the Governor had called a conference to assure milk for hospitals and

for babies. At this point the Health Department of Detroit approved the shipping in of out-of-state milk, and bulk and bottled milk began to flow in from Chicago, Cleveland, Indianapolis, and Columbus. By the last day of the strike the supply was up to 60 to 70 per cent of normal.

It is difficult to escape the conclusion that without the strike threat and needling of the Fair Share group, the substantial increase in the price of milk to these Michigan dairymen would not have been given at this time. The same can be said of every round of wage increases and fringe benefits given factory workers in the past ten years.

Cleveland and Indianapolis Organize

With milk prices what they are across the country, it is not surprising that there is unrest in other areas. In Cleveland the dairy farmers are being organized into the International Brotherhood of Teamsters—the union which has organized the dairy drivers and the workers inside the dairy. Here, some of the farmers are under the impression that the Teamsters will be able to negotiate for them and bring pressure on the dairies without the farmers using their own bargaining strength.

In Indianapolis, three farmer assocations each represent segments of the dairymen who supply the milk to this city. When a group of the farmers who have installed bulk milk tanks attempted to get the associations to bargain for them in securing a premium such as exists in other areas for bulk milk, they ran into the cold fact that divided representation means weakness. They have started a two pronged drive to consolidate the three organizations and to put some muscle into the bargaining position of the amalgamated group. In 15 counties they have held mass meetings of dairymen. The vote has been unanimously in favor of consolidating the three farmer-owned cooperatives into a single, strong organization. More surprising is the fact that a strike vote taken at these meetings has passed by more than 90 per cent in every case.

"We are asking the directors of each of the organizations to merge," George Sandefur, president of the Dairy Producers, Inc., the farmer group, said, "and if they do, our organization will go out of existence right now. If they don't, we'll take out after them like a hound dog after a rabbit and we'll have recall petitions out on every director who opposes merger. We have an overwhelming majority of the members of each of the three co-ops behind us in demanding a merger and we're going to have our way. When we have one strong organization it will be in a position to stand up to the dairies because we have already taken a strike vote to show we mean business."

Labor Unions and the Farmer

In each of these three situations, organized labor has offered to help. No fools, labor leaders do not want busted, job-seeking farmers to depress the tight city labor market. In Cleveland, labor leaders are actually organizing the farmers into a union, but many farmers feel that this is unwise. "We have got to maintain our independence if we are going to represent the farmers," Rolland Brengle said. "I don't think that a trade-union can possibly understand our problems and represent us. On the other hand I feel very strongly that we need the good will of labor and I'm perfectly willing to accept help from organized labor as long as there are no strings attached. And why should they make an offer of help without expecting something in return? Simply because labor is completely sold on the idea that a slump in agriculture can pull the whole economy down. Their own self-interest drives them to support us. The farm equipment workers' locals of the United Automobile Workers' Union know darned well that when farmers can't make money, they can't buy new equipment. And when farmers can't buy, union men get laid off. And when union men get laid off, they can't buy butter and cream and the farmer is pinched still more. The Teamsters know that if we don't get a decent price for our milk, we can't pay a decent price for having it hauled to town. These people have proved to themselves at least, that the welfare of the farmer is economically important to them."

Rolland Brengle, the Detroit strike leader, found that you can't strike against the cows; the work must go on. Meetings often kept him late — he milked his own cows after nightfall.

Labor's concern with the farm situation was dramatized when a group of the top leadership of the labor movement appeared before the Agriculture Committee of the House of Representatives and did a little table pounding. Walter Reuther, President of the powerful United Automobile Workers' Union, summed up their position, "The farmer, like the worker, is entitled to a just return for his labor. We believe that the answer to our economic needs involves raising the buying power of millions of our families without tearing down the standards of others in the process." What was even more important, those in the ranks of organized labor have offered their financial and other economic help to farmers in their efforts to bargain for a better deal. In Detroit, for example, the State C. I. O. has offered to give the Fair Share group up to $1,000 a month to help in their organizing drive.

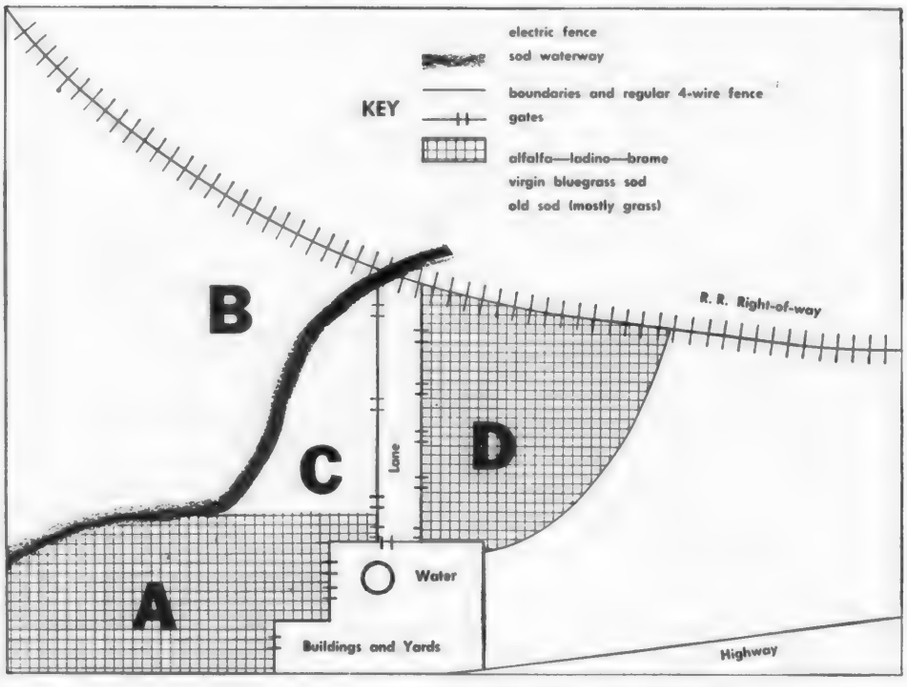
Helping, however, does not mean doing the job for the farmer. There are certain things in life, like growing up, or falling in love, or having a baby, that a person must do for himself; and there are certain things that an organized group

(*Continued on page* 122)

Two Cows to the Acre-

With strip grazing an acre will carry two cows and more throughout the pasture season

By Charles R. Koch



Even the most irregular field layout can be adapted to strip grazing. This is the way Bruce Berg used electric fence on his Wisconsin farm to ration grazing for his dairy herd. The water supply is in the barnyard to which each strip has access, either directly or by way of the lane. The strips in fields A and D are narrower than those in fields B and C because of the greater carrying capacity of the legume-grass mixture in the former. Not only are the cows confined to one strip at a time but their progress along the strip is controlled by an electric wire which is moved forward daily.

IN THE SAME YEAR Paul Revere made his famous ride to warn every Middlesex village and farm of the coming of the Red Coats, a farmer in the British Isles was outlining in his journals a system of grazing very similar to that which American dairymen are now finding so profitable under the name of strip grazing.

James Anderson, of Edinburgh, the 18th Century agronomist, advised farmers of the Tight Little Isle, where labor was much more plentiful than land:

"A farmer who has any extent of pasture ground, should have it divided into fifteen or twenty divisions . . . and the beasts be given a fresh park each morning, so that the same delicious repast might be repeated."

In the Western Hemisphere where land seemed an almost limitless and inexhaustable resource this system of intensely rationed grazing was ignored. But in recent years American farmers, dairymen in particular, have been eager to adopt any practice which will help alleviate the pressures under which they find themselves. So when observers, Dr. W. E. Petersen of the Dairy Department at the University of Minnesota among them, returned from New Zealand a few years back with enthusiastic reports on how the farmers down under were getting phenomenal returns from their rugged grazing lands by intensive management, some American dairymen began cutting their big pastures into small lots and making their cows concentrate their grazing on a piece at a time before moving on to greener swards.

The New Zealand facts are certainly enough to leave a Yankee bug-eyed. Five hundred pounds of butterfat per acre per year from pasture is their goal. And those who calculate such things say that the annual output of such a weight of butterfat requires the kind of pasture management that will provide the cow or cows producing it with an intake of 14,000 pounds of dry matter per acre. While pastures under unrestricted, continuous grazing may produce this much provender, it is only intensive management that can transform it into a marketable product.

Farmers who have resorted to this kind of management in the past few years are now wondering why they didn't adopt it sooner. Roland Clausing, a Grafton, Wisconsin dairyman, for example, when asked to warn others of the possible pitfalls they may expect to encounter in their first attempts at strip grazing, flatly stated, "There are none. In my opinion strip grazing is all advantages and no disadvantages."

Joe Canby, whose Greenwood Farm in eastern Pennsyvania ships its milk into the Philadelphia market, advises anyone thinking about strip grazing "to stop thinking and do it now."

Good Pastures Essential

Getting into the swim isn't much of a task at all. Good pastures, of course, are essential; for the old blood out of a turnip routine is simpler than getting high TDN (total digestible nutrients) out of unimproved pastures. But given a good field of alfalfa-Ladino-brome grass or a comparable mixture, the only problem is dividing it into small paddocks. "This," says Carl Gilman, county agent of Ozaukee County, Wisconsin, and a leader in the strip grazing crusade, "I thought would be the biggest obstacle—this business of the extra fencing needed. But it hasn't bothered our farmers at all. After all, the farmer is a pretty ingenious fellow. With electric

Electric fencing and improved pastures are the team which make strip grazing practical. Clipping to control weeds and harrowing to spread the droppings are necessary to get top performance. Farmers using the system report their cows never have to be driven to pasture; they are always eager to get to the fresh plot offered them each day.

fencing readily available he can cut up a field in no time at all and shunt his cattle around like box cars in a freight yard."

Without electric fencing the project would be expensive and cumbersome. If a man finds the charged wire an impractical means of confining his herd, strip grazing is probably not for him. Zero pasture, where the forage is clipped and hauled to the barnlot for feeding, would be his alternative.

One of the most successful of the Wisconsin strip grazing pioneers is young Bruce Berg. Working with his father, Bruce operates the Park Farm, a few miles west of Waukesha, on which his grandfather started in the purebred Guernsey business over 50 years ago. In the spring of 1954, Bruce's brother was working with them, too, so they found themselves with a combination of three able-bodied men and more than 100 head of Guernsey cattle on a farm of 143 acres.

"Well," says Berg, "we'd been to a meeting over at Waukesha where we had heard George Werner and some others from the University tell about how wonderful this strip grazing is, so we decided that since we had plenty of manpower we'd try it.

"To the west of the buildings here we had a good seeding—just a little less than six acres—of alfalfa, brome and Ladino. To the north of this piece was another field that had just been tiled and that had a pretty good sod of all kinds of grass on it—bluegrass, timothy, brome and quack grass. All told, this and the six acre piece gave us about 23 acres of pasture and we decided to strip it."

Berg goes on to tell how they divided

(*Continued on page* 77)

This colorful character, the blue blowfly, breeds in the wounds of animals as well as in carcasses.

The Dirty Fly

By Fred Knoop

In the cold war with flies, man is at a disadvantage. He is far outnumbered, and besides, he is a tenderfoot. Scientists point out that the fly has been around the earth for something like fifty million years, in contrast to the newcomer —man—who, it is estimated, has been here only five hundred thousand years.

So, when we start pumping a hand-sprayer at the flies that are buzzing about the barn in June, we very likely provide these shrewd insect enemies with a good laugh. For the chances are 50-50 that the fly-killing spray is one that the flies met last year and now, through their natural instinct for survival, have developed a resistance to. And as a fly would say, "So what's the difference, there are plenty more where I came from."

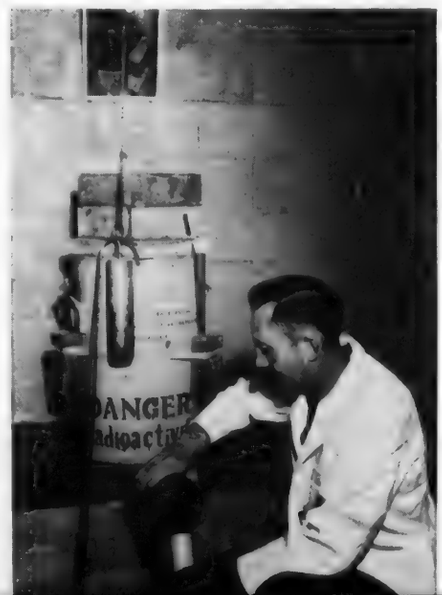
The World of Instinct

The world of the fly is simple and well-ordered. He has only to find food, sleep in the sun, and do his duty by procreating more of his kind. He is not burdened with the demand put on higher orders of animal life, that of being intelligent. His every need, all the timing of his existence, are taken care of by a mysterious plan of nature, given to him as instinct.

The female fly will lay eggs any time from the third to the twenty-third day after she takes to the air. After she has been fertilized by the male fly, the egg laying takes place every few days in warm weather. Flies, studied in captivity, have laid eggs at the ripe old age of thirty days, which is about the end of fly life. House flies lay their eggs in damp manure; stable flies prefer a straw-manure mixture.

The eggs are laid in clusters, about 100 at a time. They are white and look like small, slender rice grains. The average female will lay about 500 eggs in her lifetime; some will lay up to 2000. All insects have big families, and flies are no exception. According to the entomologist, Hodge, offspring of a single pair of house flies that set up housekeeping in April might number 191,000,000,000,000,000,-000 by frost time in September. That's enough to cover the earth's surface 47 feet

A. J. Graham, entomologist in charge of rearing screw-worms at the USDA laboratory in Orlando, Fla., prepares to expose 6,750 pupae to cobalt-60 radiation. This sterilizes the males and prevents reproduction.



deep with flies. Fortunately, for all of us, this paper population never exists, for nature holds flies in check with heat and cold, birds, toads, frogs, diseases and other insect enemies. Man kills a few with insecticides. But it is quite possible for 100 descendants of the couple to be alive at the end of the season, and that is a startling enough increase in population.

In half a day, if the weather is warm, the eggs hatch out into maggots that grow to be one-half inch long. In the damp, warm manure they are in clover, plenty of protein-rich pasture on every side.

For five days the maggot grows and absorbs energy for the tremendous change that lies ahead. On the sixth day this easy life ends. Now, the worm must construct a hard, protective, brown pupa case around himself. Often he will want to be alone, a foot or so away from the manure pile, on higher and drier ground. In the pupa stage of his development he is helpless and he can seek no food. Within this motionless case intense activity takes place, a metamorphosis from a sluggish worm into a speedy flyer. In five days wings, legs, eyes, antennae, will develop. And on the sixth day, the covering splits and out steps the fly, full grown. Only a few minutes exposure to the air will harden his wings and give him his delicate touches of color. He is now ready to do his dirty work.

The housefly feeds and walks on filth, then leaves a trail of germs on food, milking equipment, or anything he can alight on. His spongy mouth is well designed for taking liquid food like milk, sirup, and moisture from decaying food and fecal wastes. If the food isn't moist, he has an ingenious way of eating it. If he wants to eat a lump of sugar, he vomits up part of the contents of his crop and converts the sugar to a liquid. To add insult to injury, he not only leaves flyspecks on whatever he walks on from this unsavory process, but he adds a few more when he defecates before flying away. The stable fly, horse fly, deer fly, and horn fly can add the bite of their stiletto-like beaks and draw blood from the animal. This adds the hazard of blood-borne disease and infection when animals or humans are bitten by them.

If you pick any figure you like between 100 and 200 million dollars, you will be safe in tagging the cost to farmers of stable flies, horse flies, horn flies, and houseflies, in terms of meat, milk and disease loss. These three flies carry dysentery, anthrax, tuberculosis, and are suspected of carrying many other diseases. If you bring into the list screw-worm flies and bot flies, members of the same order, *Diptera* (true flies have only one pair of wings: *di*=two; *ptera*=wings), the cost can soar to figures we don't even like to think about.

Killing Flies with Atoms

To battle the stable flies, horse flies, and

NEW WAYS TO GET THE JUMP ON FLIES THIS YEAR

Here are the new fly control methods, based on USDA recommendations:

Space Sprays

Several kinds of safe, ready-to-use space sprays for killing flies in loafing barns and farm buildings are available. Look for those that specifically state they can be used on animals, or where animals will congregate.

Surface Sprays

Surface sprays are put on walls of farm buildings with a sprayer, while the animals are out of the building. Flies are killed when they come in contact with the residue. Sprays of this type are effective for several weeks. Chlordane, DDT, Diazinon, lindane, malathion and methoxychlor are recommended.

DDT and chlordane are *not recommended* for use inside dairy barns.

DDT and methoxychlor are available as wettable powders and emulsifiable concentrates. Make a 2.5 per cent suspension (wettable powder and water) or a 5 per cent emulsion (emulsifiable concentrate and water). To make the suspension, mix 2 pounds of a 50 per cent wettable powder with 5 gallons of water. To make the emulsion, mix 1 gallon of a 25 per cent emulsifiable concentrate with 4 gallons of water.

Chlordane is available as a 2 per cent chlordane preparation that is ready to use when purchased. Or you can make a 2 per cent emulsion by mixing 1 pint of a 50 per cent emulsifiable concentrate with 3 gallons of water. If the product purchased contains a lower or higher percentage of the insecticide, use proportionately more or less of it.

Diazinon is mixed 2 to 4 quarts of 2 lbs. per gallon emulsifiable concentrate or 8 lbs. of 25 per cent wettable powder per 25 gallons of water, applied at 1 gallon per 1,000 square feet of surface. A bait spray consisting of 4 lbs. of 25 per cent wettable powder and 5 lbs. of sugar per 25 gallons of water has also been approved for surface application. Diazinon is now approved for dairy and other type barns.

Lindane. Make a 0.3 per cent spray. Use one of the following mixtures: ½ pound of a 25 per cent wettable powder with 5 gallons of water; or 1 pint of a 20 per cent emulsifiable concentrate to 8½ gallons water.

Malathion. Use 2 gallons of emulsifiable concentrate (5 lbs. malathion per gallon) per 100 gallons of water, applied at 1 gallon per 1,000 square feet of painted surface or 2 gallons per 1,000 square feet of unpainted surface. With 25 per cent wettable powder use 32 lbs. per 100 gallons and apply as for emulsions. Malathion is now approved for dairy and other type barns.

The New Baiting Methods

Try to buy a ready-to-use dry bait. If it is not available, buy Diazinon, Dipterex or malathion in the form of a wettable powder or an emulsifiable concentrate and make the bait.

Liquid Bait. Make a liquid bait by mixing an attractant—molasses, sirup, or sugar—and one of the poisons with water. The finished bait should contain 0.1 per cent of insecticide and 10 per cent of attractant. A bait mixed in accordance with the chart below will contain these percentages of insecticide and attractant.

Dry Bait. Dry granules and sugar baits are available under various trade names.

Applying the Bait

When flies are numerous, spread bait daily. When fewer flies are seen, spread bait once every 3 or 4 days. If flies again become numerous, increase frequency of application.

If you buy a ready-to-use dry bait, apply it according to the directions on the container.

Apply home-made liquid bait with an ordinary sprinkling can. Plug about half the holes so that the bait will spread thinly in strips 4 to 6 inches wide on floors. If the floors are covered with dirt or litter, sprinkle the bait on sheets of tin, wood, paper, or other material.

For control in and around poultry houses, sprinkle the bait where poultry cannot reach it—under the cages, on window ledges, in feed rooms, on sacks or boards, and outside where flies gather. Be careful not to contaminate feed, water, or utensils. Apply at the rate of 1 gallon to 1,000 square feet.

Apply dry sugar or granulated bait with a shaker-top can. Sprinkle thinly in narrow strips on floors, walkways, window sills, and other places where flies gather, but not where it will contaminate animal feed, water, human food, or utensils. Use it only on dry, firm surfaces. On straw, the bait may fall where flies cannot get to it.

Apply at the rate of 3 tablespoonfuls per 1,000 square feet—or about ¼ pound for an average-size barn (one with about 2,000 to 4,000 square feet of floor). Use larger quantities if flies are numerous.

Paint-On Bait

Neither a dry bait nor a liquid bait gives good control of flies in animal pens in which the ground is trampled, littered, or muddy.

A paint-on bait usually gives good control in these places. It is applied with a paintbrush to suitable surfaces nearby, such as posts, railings, or board fences. Corn sirup, blackstrap molasses, or a thick water-and-sugar slurry containing 1 per cent of malathion. Diazinon or Dipterex make a satisfactory paint-on bait.

To prepare the bait, put 8 ounces (½ pint) of a 25 per cent emulsifiable concentrate or 8 ounces (½ pound) of a 25 per cent wettable powder in 1 gallon of attractant. Mix thoroughly with a paddle.

Dipterex can be mixed as follows: Add 4 lbs. of 1 per cent sugar bait to 1 pint of water. Mix with 2 pints of sirup.

Apply the bait whenever flies become numerous. Paint or daub it on. If it is not destroyed by rain, one application is effective for about a week.

If you apply bait to a fence around a pen, apply it only to the outside.

A fence around an average-size calf or pig pen can be adequately treated with 2 quarts of bait.

Precautions

Avoid getting poisoned-bait concentrate in the eyes or on the skin. If it is spilled on the skin, wash immediately with soap and water; if it is spilled on your clothing, change clothing immediately. . . . Wash your hands thoroughly after spreading bait. . . . Keep baits, and the poisons used in making them, where children, pets, and livestock cannot reach them.

Guide for Mixing Liquid Bait

WATER	ATTRACTANT	INSECTICIDE		
		25 per cent emulsifiable concentrate	OR	25 per cent wettable powder
Gallons	Pints	Tablespoonfuls		Tablespoonfuls
1	¾	1		2
3	2¼	3		6
10	7½	10		20

Barn fogging method that gives good daily fly control has been tested at the University of Wisconsin by E. H. Fisher. A permanent installation of ½-gallon foggers filled with a pyrethrin-type spray is connected to a central air compressor with rubber hoses. The cattle are fogged shortly before milking.

Fly-cords impregnated with parathion are strung through a milking barn in South Carolina. Tested over a period of years by the U. S. Public Health Service the cords have given summer-long control over flies.

A quick way to control hornflies on cattle is to take a tablespoonful of Marlate (50 per cent methoxychlor) and spread it around over the spine of the animal with a few sweeps of the hand.

Fogging with knock-down sprays is still one of the best ways to eliminate flies at milking time. Pyrethrins with other activating chemicals make these sprays safe to use on animals.

Fly Flakes and similar products containing malathion can be spread on floors and in places where flies congregate. They have a killing effect for several weeks unless washed away by rain. They also can be spread on manure piles to kill maggots.

Liquid baiting, using a sugar or sirup to attract flies and an insecticide to kill them, eliminates tremendous numbers of flies. A sprinkling can with most of the holes stopped up makes a good dispensing tool. The mixing methods are given on page 73.

houseflies is a big enough job for most of us, a job so big it ought to be well planned. The story of how the screw-worm was brought under control reads like a piece of science fiction.

Screw-worms are a sectional pest of the South and Southwest and the work done by the USDA Laboratory at Orlando, Florida, is encouraging to livestock raisers in that area.

In 1954, the Veterinary Service of the Government of Netherlands Antilles on the Island of Curacao requested help on its screw-worm problem from the Entomology Research Branch, USDA, at Orlando, Florida. The island is about 40 miles off the coast of Venezuela. The work done at Kerrville, Texas, by Bushland and Hopkins from 1951 to 1953 had shown that by using gamma rays from radioactive cobalt-60, the male screw-worm fly could be sterilized and made incapable of fertilizing the eggs of the female. The isolated population of screw-worms on the island of Curacao was ideal for checking the radiation technique on a large scale and for trying for a complete eradication.

Screw-worms were reared in the laboratory at Orlando, about 50,000 a week, for the experiment. When the pupae were 5 days old, they were subjected to gamma rays for about 20 minutes. The adults emerged 2 days after irradiation, and within 24 hours they were distributed by airplane over the island, having been air-lifted from Orlando to Curacao. The screw-worms were packed in number 1 Kraft paper sacks with a little excelsior. In releasing the flies, an entomologist rode in a low-flying, small plane and tore open the sacks before dropping them. Flies were distributed in lanes one-half mile apart each week. A series of pens of goats with flesh wounds located throughout the island were used to check the results.

During April and May of 1954, when 100 sterilized males were released per square mile, 15 per cent of the island

females were laying infertile eggs. From August to October the Island was treated at the rate of 435 sterile males per square mile; the sterile egg masses increased from 69 per cent to 100 per cent and the screw-worm fly population was wiped out.

This eradication of screw-worm in Curacao has sparked a tremendous program that is to be tried in the near future in the southeastern part of the United States. Fifty million screw-worm males to be raised a week, is the goal set for undertaking the control program. If part of the 25 million dollar loss from screw-worms can be prevented, it will be worth the money.

Can We Kill Every Fly?

Can this same treatment be used for stable flies and houseflies to give us a fly-free country? "It's unlikely," says J. C. Keller of the Entomology Research Branch at Orlando. "For one thing, the key to killing this insect is that the screw-worm female fly mates only once. Once she has mated to a sterile male, there are no offspring. Houseflies and stable flies mate several times, so the control would be extremely difficult. What we are working on with gamma ray treatment is to find a bad recessive mutation which we would spread among the stable and house fly population. If, for example, we could use our radioactive treatment to develop a recessive in a strain of flies which would cause winglessness when they breed to normal flies, we might start a chain reaction and eliminate many flies."

The War-Born Chemicals

After World War II, DDT seemed to be the answer to the fly problem. Sprayed on walls and ceilings of farm buildings, it made flies so scarce that scientists talked about the day when we would have no flies. They even worried about the loss of certain types of flies that are beneficial in pollinating blossoms. But this was only a short truce in the battle, for nature's plan is to perpetuate the species regardless of whether man likes it or not. By 1947 flies that were resistant to DDT began to appear. As these strains of flies became more widespread and more resistant, we had to find new insecticides, and it has been a see-saw battle ever since. Among the chemical compounds that have been used with success are benzine hexachloride, lindane, methoxychlor, TDE, chlordane, toxaphene and dieldrin. Flies have developed resistance to each of these in varying degrees. To meet the increasing number of resistant flies the older, safe fly killers, pyrethrins and the organic thiocyanates again came into use. These materials and pyrethrin synergists, like pipernol butoxide or Sulfoxide (a synergist is a chemical that multiplies the effectiveness of the basic ingredient), make safe knock-down sprays. The organic thiocyanates and pyrethrins are compounded with methoxychlor for use in most of the oil-base sprays on the market today.

There is no one completely effective way to kill all the flies around the farm; it's a matter of control and we do have new chemicals, and new ideas, all of which make our control better. For instance, we can keep the fly population down to zero in screened-in milking parlors and milk houses.

In loafing sheds, chicken houses, hog houses, there are too many outside flies wandering in, and we must keep after these visitors with sprays and baits and "varnishes." Flies have been known to travel as far as 13 miles, more if there are high winds. The farm that has plenty of fly food will attract more than just its own fly population; it gets those from its untidy neighbors, too.

Getting the upper hand over a few flies can be done mechanically, with a strong right arm and a fly swatter. And there are still many farmers who use electric screens. As one Wisconsin dairyman says, "I kinda like that hiss and crackle of electricity on the fly screen because I know it means a fly is dead for good. I didn't like the smell of burning flies at first, but now I even like that!"

But most of our farm fly-killing these days is done with chemicals. We have organic fly-killers like pyrethrin, the dust of a chrysanthemum flower that grows in east Africa. Now many of the pyrethrin-type fly-killers are made from synthetic products, like allethrin. Pyrethrin and synthetic allethrin are used mainly as sprays, with mineral oils and odorless kerosene as the carriers. These oils poison and suffocate insects.

DDT, methoxychlor, lindane, chlordane, aldrin, dieldrin, toxaphene, are all organic chemicals used in fly-killing. The newer phosphorus compounds such as TEPP, parathion, malathion, Diazinon, Dipterex, are all high-powered insect killers which are used in flakes, strings, molasses solution, and dusts for fly baits.

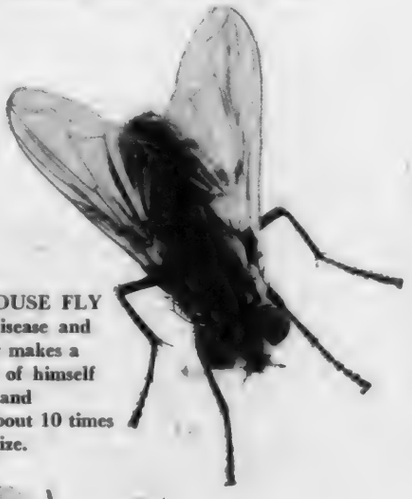
How Insecticides Work

Chemicals affect different insects in varying ways. So we first select an insecticide that we know is effective against flies in the method of attack we intend to use. Some chemicals are used as stomach poisons and are offered to flies to be eaten; often we take advantage of a fly's sweet tooth to bait him. Contact poisons are sprayed into the air near, or on flies, and enter their bodies through the skin. Research has not disclosed the exact manner in which insecticides poison flies. The symptoms that flies exhibit when they are dying from DDT and several other chemicals are those of a nervous disorder. Scientists suspect that many fly-killing chemicals poison the enzyme cholinesterase, which is necessary for the fly's nervous system to function properly. Most farm boys have watched poisoned flies stagger along the edge of a water tank before finally falling over into it.

(*Continued on page* 100)

THESE ARE THE COMMON FLIES THAT BOTHER MAN AND BEAST

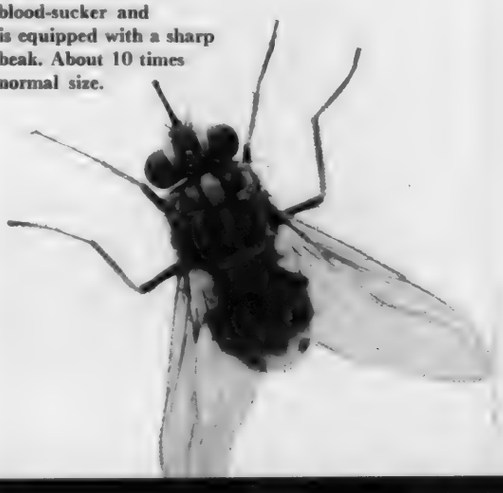
THE HORSE FLY is a blood-sucker of the worst sort. Milk and meat production go down when he is around. About 3 times normal size.



THE HOUSE FLY carries disease and generally makes a nuisance of himself in barn and dairy. About 10 times normal size.

HORN FLIES congregate in masses on the backs of cattle and suck blood. They cause serious milk and gain losses. About 10 times normal size.

THE STABLE FLY works on the belly of animals. He is a blood-sucker and is equipped with a sharp beak. About 10 times normal size.



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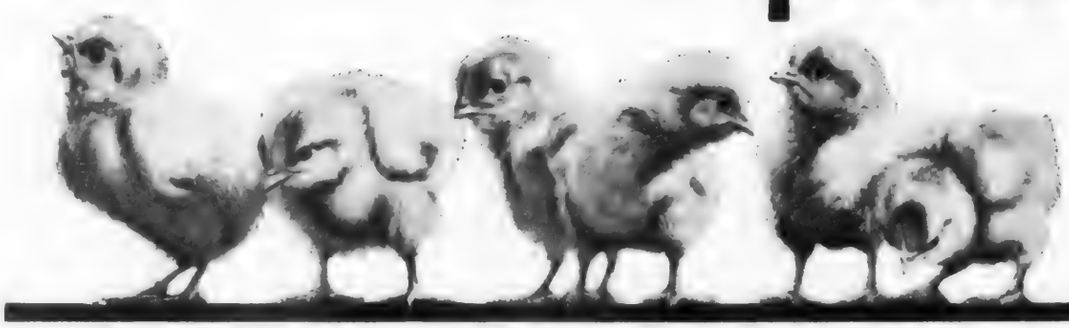

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TWO COWS TO THE ACRE

(*Continued from page* 71)

the six acre field into 4 strips, each 90 to 100 feet wide, and cut the larger field into 3 strips. All these strips had access to the barnyard for water. "How big to make these strips was the big question when we started," he says. "We just took a good guess based on the stand of grasses and legumes and that's what we came up with. All the fencing was done with electric fence. We used a single piece of wire to cross fence the strips and moved this cross piece daily, allowing the cows 4 or 5 days to graze down one of the good alfalfa-brome-Ladino strips, about 3 days on each of the grass strips. After the cows were taken off a strip we clipped it with a rotary mower to control the weeds and help spread the droppings a bit."

Using this system the Bergs pastured 43 cows on 23 acres from May 20 to September 20, 1954. "We fed them hay, silage and grain, too," Bruce recalls, "partly as a preventive against bloat. But they didn't eat very much except pasture. Last summer we didn't feed silage at all and our grain consumption was so small I have been toying with the idea of figuring out a way to let them have it self-fed."

Last year the Bergs put the plow to the larger grass field and again used the 6-acre field for pasture plus 7 acres to the east of the buildings. These 7 acres had raised a 134 bushel corn crop two years earlier and in the summer of '55 supported a luxuriant growth of alfalfa, brome and Ladino. The new field was divided into 5 strips. Pasturing the same bunch of cows 3 to 5 days on each strip, this total of 13 acres of pasture carried the herd from May 14 to September 16 during a summer "so dry a man had to be primed to spit." This figured out to 125 pasture days. With 40 cows in milk it made 5,000 cow days from 13 acres. The cows produced in this time 124,538 pounds of 4.85 per cent milk, or about 1000 pounds a day.

To top it all off, according to Berg, 1954 and 1955 were the first years in the history of the farm they were able to raise enough hay. Prior to this they had been forced to buy as many as 60 additional acres of hay. That stopped when strip grazing released more land to meadows and drastically reduced the summer feeding of hay and silage.

The 3-F's

The secret of this success was a combination of the 3-F's, forage, fencing and fertilization.

The fencing, as indicated, is all electric. Wisconsin farmers seem to be particularly adept at handling the hot wires. The Bergs use pointed, short wood posts which they find easy to drive into the ground in the spring when they are laying out their strips; and they use smooth electric fence wire. To adjust the cross wire and

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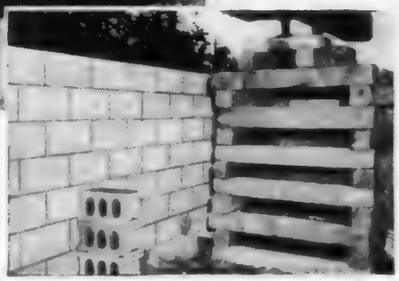
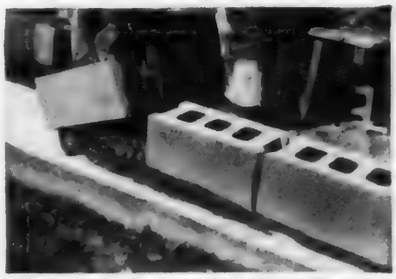


Timber cribs supported house during remodeling



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keep it tight they use 4x4's on the end of which they have nailed cross pieces so that the posts will stand by themselves. Thus, if their cross wire is, for example, 100 feet long and they are grazing a narrow piece of strip only 85 feet wide, they simply hook each end of the wire on opposite sides of the strip and take up the slack by pushing the posts forward. Since their cattle must have access to the barnyard for water they make no effort to back fence, that is, to keep the herd from coming back to graze that part of a strip it may have grazed a day or two before.

This system, Berg says, has cut their fencing expenses—both in time and money—to a minimum. "The rotationally grazed fields are the only ones on the farm we bother to fence," he explains. "The first year we tried the system we bought three rolls of wire at something like five and a half dollars a roll and it took us two days to put up the fencing. Last year it took us only one day. Moving the cross fence every day, or every morning and evening as we did last year, takes about fifteen minutes each time."

The forage members of the 3-F team are, as noted, alfalfa, Ladino and brome grass. The Bergs have found that Ranger alfalfa is much less susceptible to winter kill than other varieties they have used. With it they can maintain a good legume-grass mixture for 4 years. Ladino is the champ, in their opinion, in its ability to take a terrific beating in the way of trampling and grazing and snap right back after a short rest.

Any system which confines large numbers of cattle to relatively small plots is undeniably going to cause more trampling than a system in which they are permitted to range over a larger area. Rest, and the use of the right kinds of grasses and legumes, is the solution to this problem.

Soil tests are the key to fertilizer application on Park Farm. In 1954 the 13 acre grass field was given a dose of 400 pounds per acre of 10-10-10 the middle of April.

The legume grass field had been fertilized at seeding time in 1953 with 250 pounds per acre of 0-20-20. In 1954 it was top-dressed with 600 pounds per acre of muriate of potash and 1000 pounds per acre of rock phosphate; and before the start of the grazing season last year each strip had an application of 10-10-10 at the rate of 400 pounds per acre.

Summing up his experiences Bruce Berg says, "If your pastures are away over on the back side of the farm, strip grazing may present some annoying problems. But when they are close to the barn strip grazing just can't be beaten."

Armin Clausing, brother of the Roland Clausing mentioned earlier, likes the system even though his pastures might not be too handy to the barn and water. He has 75 head of Guernseys on his 110-acre farm and has been using strip grazing for three years. His pasture is a 13.7 acre field divided into 4 plots, each 30 rods long by 20 rods wide and each containing about 3¾ acres. The fencing is electric, with a battery type charger. Water is hauled to the plots in a 600 gallon tank.

Like the Bergs, Clausing is sold on an alfalfa-brome-Ladino forage mixture. He regularly applies around 8 tons of manure to the pasture and last year tried 350 pounds per acre of 12-12-12 on one of the strips. While he made no scientifically accurate test of the results he is convinced from the appearance of the plot and the performance of the cattle that the results were well worthwhile.

Members of the University of Wisconsin Dairy Department measured Clausing's cows before and after the grazing season (in lieu of weighing them) to determine what gains or losses they made in weight. These figures, together with the 3,859 pounds per acre of 3.5 Fat Corrected Milk they produced while on pasture, indicate that they were afforded an intake of 2,840 pounds of TDN per acre.

Besides the grazing, Clausing got 15 tons of silage from a first cutting off this field and 3 tons of hay from a second cutting. All this in a very dry summer.

How do the cows feel about strip grazing? Clausing has an answer for that: "You never have to drive them to pasture. They are always eager to go onto a new piece of grass. One man can move the fence in about 15 minutes, but usually he had better leave the cows in the barn lot until he's done the job. He's likely

to have a hard time holding them until the fence is moved. Even on hot, muggy days they go right to pasture without being driven."

Asked if he ever gets the feeling that the extra work demanded by strip grazing may be just a waste of time, Clausing answers, "It pays more per man hour than anything else on the farm."

These views pretty well represent a consensus of those who have tried strip grazing. They like it, it pays off and they wouldn't go back to continuous grazing even though it might save them some work.

The Fine Points

Anyone thinking of trying this system of grazing for the first time will be interested in the advice of some of the experiment stations. Wisconsin offers the following suggestions:

In grazing tall growing legumes (1) let them reach a stage of growth approaching the bloom stage before grazing; (2) harvest quickly with a heavy stocking rate per acre; and (3) give them a growth recovery period of 3 to 5 weeks during which they are protected from grazing.

The point to remember is that the plot should be stocked heavily enough so that the forage will be grazed down quickly. For this reason it is best to err on the side of smallness when laying out the plots. A large number of small plots is usually better than fewer large ones.

Not less than a four inch stubble should be left when the cattle are moved to a new plot; but if considerably more than this is left, say five to eight inches, it is probably a good indication that the plots are understocked.

A 50/50 mixture of grasses and legumes seems to work best in Wisconsin. This may be true in other regions, too. F. V. Burcalow, extension agronomist at the University of Wisconsin says he has observed that the highest producing pastures are heavy on Ladino—running anywhere from 25 to 75 per cent of this legume.

Bluegrass or fall sown small grains given a boost with an application of nitrogen can be used to provide early spring grazing while waiting for the legumes to come into their own.

Rate of stocking can only be determined by the individual farmer after making an appraisal of his forage stand. A rather common rule of thumb is to plan on 2 cows (mature animal units) per acre throughout the season. If stands are good and strong, though, Wisconsin suggests for early season stocking 50 cows per acre per day, or 25 per acre for two days, or 17 cows per acre for 3 days. Later in the season it will be necessary to increase the acreage, reduce the length of the grazing period on each acre, or reduce the number of cows per acre.

Spread Droppings

Obviously, when large numbers of cattle are carried per acre, the droppings will

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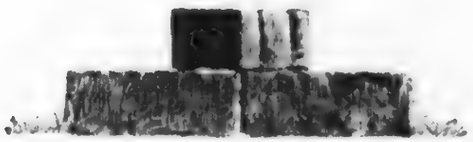

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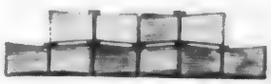

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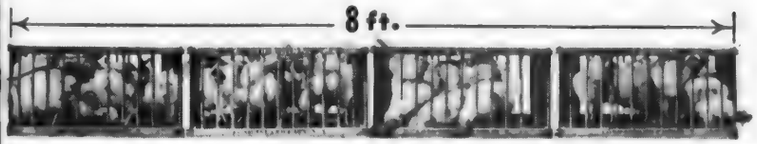

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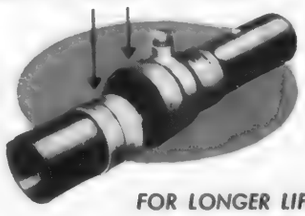

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Charter Member—Sprinkler Irrigation Association

be relatively concentrated. Unless some effort is made to spread the manure between grazing periods the productivity of the pasture is seriously retarded. It has been estimated that contamination by unspread manure reduces grazing 15 per cent on the second round and another 20 per cent on the third grazing. Clipping helps to distribute the droppings; and the Scotch type harrow is perfect for breaking up the clumps and distributing the manure evenly over the strip.

Dr. M. R. Teel, of Purdue University, has recently completed some studies with brome grass which give valuable pointers on the management of this and similar grasses in pastures. The center of growth of the brome grass shoot is in the joint near the base. If the plant is grazed or clipped below this point before the second crop of shoots has pushed through the soil, future growth will be seriously retarded if not checked completely. This does not mean that brome cannot be grazed until mid-May, by which time the secondary tillers would ordinarily have made a healthy growth; rather, it means that the pasture should be so managed in late April and early May that the plant is not grazed or clipped below this vital point. This feature is even more important as a guide for harvesting the second crop of brome tillers.

Orchard grass and fescue do not have this growth characteristic. Dr. Teel feels this makes them two of our most efficient grasses. They can be cut or grazed at practically any time and under any but the most adverse conditions will recover immediately. And speaking of these grasses, it is a good practice in connection with strip grazing to save a good piece of sod for a tramping ground on days when it is too wet to turn onto new stands of grasses and legumes. Fescue is a natural for this.

Another factor in the efficient management of brome grass is to keep the plant from heading out. Once it starts making seed, the secondary tillers are deprived of the food which would enable them to go ahead and make rapid growth. If the heads are clipped this nourishment is transferred to the secondary tillers and they come bouncing right along.

Dr. Teel makes another point that seems to have been largely overlooked in the management of super pastures in the cornbelt. "The big problem with pastures is that they lack fiber," he says. "The Danes have an expression, 'Let them harden off'; meaning let them reach a point where they contain a higher percentage of fibers and carbohydrates. The idea is that the green matter in pastures contains plenty of protein but not enough energy and it passes right through the animals without doing too much good.

"You've seen cattle walk straight across the finest looking brome and alfalfa to eat bluegrass in a wood pasture. What's the reason? They're looking for that bulk.

Really built to take it!

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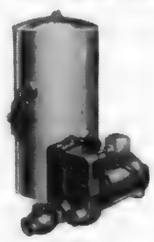

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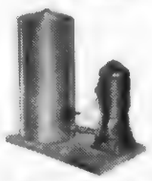

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"A steer will meet his protein requirements on lush pasture two and a half to three times before he will get enough TDN. Those of us who have been pushing grassland farming should also consider its limitations. The Dutch have a practice of throwing straw or beet pulp or other bulky materials on their pastures to achieve a 'hardening' effect. American farmers certainly wouldn't go far wrong to follow suit. Many achieve this with crushed ear corn."

This is strip grazing. It is merely an extension to the fields of the same intensive methods and meticulous care that the dairyman practices in his barn and milking parlor, a way to strip each acre of the last drop of production while conserving its ability to rebound time and again with a lush growth of forage.

HOW TO MOVE IRRIGATION PIPE

(*Continued from page* 51)

this spring, runs $10 a lineal foot for a five-inch pipe system and $10.25 a foot for a six-inch pipe system. This would make a 40-acre installation, which runs around 640 feet, cost $6,400.00 f. o. b. Valley, Nebraska. This price includes the cost of installing the system but does not include such important items as a pump and power unit—which can add anywhere from $800 to $2,500 to the cost—extra pipe, if the water must be piped to the center of the field, a tow cable at 20 cents a foot, which must be somewhat longer than the pipe line, and waterproof safety wire running from the pump and power unit to the pivot point.

Whether or not a mobile system will pay off depends upon its cost and also on the amount of use it will get during the season, and the cost of labor. Gordon Hawkins, the Washington engineer, gives an example of how this might work out: "A four-inch lateral line, twelve hundred feet long, might cost the farmer around $1,200 for a hand move job. Put wheels under it and the price could go up to around $2,400. Now if the farmer only goes over his crops four or five times a season, the labor he saves may only amount to around $100 and it will take him twelve years to pay for wheels. I've seen farms, on the other hand, that would use the system enough to pay for it in two or three years." Some farmers have reported that it took just one year to pay off.

In figuring the labor cost, one important factor is whether the extra labor required by hand moving can be kept busy on other farm work between moves. If the work load is such that the extra man needed to move the system by hand is loafing between moves —you'd better charge the irrigation project with all of his time.

Moving with a Wagon

With high pressure equipment and with the main line of any system, the pipe is most often moved on a wagon or on racks built on the tractor or jeep. One of the most important factors here is field layout so that the wagon can be pulled through easily. Main lines should be laid along the edge of the field with room left for the tractor and wagon. In the case of heavy laterals which are to be moved by wagon, two rows should be left out of tall crops so that the wagon can get through. Some farmers plan their cropland so that corn and pasture crops are planted in alternate strips—each just wide enough so that half of it can be watered with one setting of the lateral line. In this way the line is moved only on the low growing pasture crop; it is first set on one edge of the pasture and half of the corn strip, then moved to the other side of the pasture strip where it finishes watering the pasture and half of the next corn strip.

One clever new device is the two-wheeled pipe wagon which is built in such a way that it can be pulled from either end. With this rig, the tractor can go up one row, hook onto the other end of the wagon and pull it down the field for the next setting. In this way, the farmer doesn't have to worry about turning the pipe to get the right end pointed in the right direction.

This article tells why...

YOU CAN'T AFFORD TO GAMBLE ON CUT-RATE IRRIGATION SYSTEMS

HOW TO BUY AND FINANCE
AN IRRIGATION SYSTEM
Planning an irrigation system is a job for the engineer; don't bite on the do-it-yourself ads
The Farm

"You just can't go out and buy an irrigation system like you would a tractor—each system must be tailored to the farm, to its soil and to the crops that are being raised. But, like a tractor, an irrigation system works like a machine with all of the parts planned and fitted to operate together. No man in his right mind would buy a ton of assorted tractor parts and expect to put them together to pull his equipment. Yet farmers do bite on the engineer-it-yourself sale of cut-rate equipment."

This was the lesson one farmer learned by hard experience. His "do-it-yourself" system finally cost him 10% more, was too expensive to operate and inadequate for his requirements.

Read this article. See why it pays to rely on irrigation specialists . . . men like the dealers who handle highest quality pipe . . . strong, rustproof Reynolds Aluminum Irrigation Pipe. Quality aluminum pipe from Reynolds will provide a reliable lifetime for your system, pipe that meets the service requirements of rugged handling in your fields. Make sure the emblem below is on the pipe you buy.

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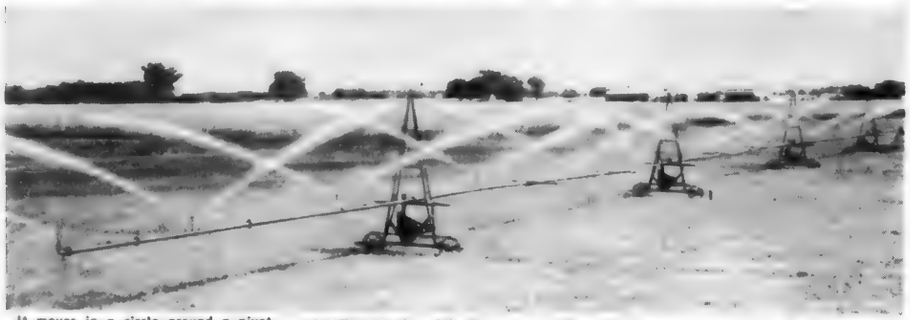
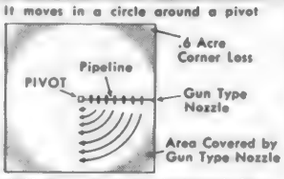


It moves in a circle around a pivot



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"It's the best way to get good silage I've ever come across. I'm using STA-FRESH from now on."

Yes, dairymen across the country are talking about STA-FRESH Sodium Bisulfite . . . the low-cost, easy-to-use powder that keeps silage fresh and full of good food value. Here are some of the reasons STA-FRESH has earned such enthusiasm:

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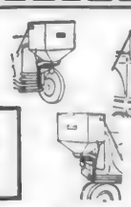

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Hand Moving

There are more good tricks, more labor saving methods, and more room for improvement in moving pipe by hand than in any other method. The more actual manual labor there is in any job, the greater will be the difference in efficiency between farmers. But even the best ones can benefit from planning. An example of good planning comes from the University of Nebraska where a study of pipe moving was made by the University with funds supplied by the Aluminum Company of America.

On the University's experimental farm, Hollis Shull, assistant in Agricultural Engineering, was running the irrigation system which was used to water corn. All of the pipe was moved by hand. "I wouldn't say that pipe moving was the worst job I've known," Shull said, "but we did have difficulty hiring men to do the work and we never were able to get the same men back a second year. Part of our project was to study pipe moving and see if we could come up with some improved methods."

They made a careful time study of the job to find out how much time it was actually taking. They then studied every move made by the two men who were working on the pipe. Next, they tried to work out better methods. Without spending a penny for extra equipment, they lowered the time spent on irrigation from 3.7 man hours per acre per irrigation to 1.5.

Cutting the work time to less than half did not make the work harder, it simply made every effort count. Methods of moving pipe were studied and it was found that disconnecting all of the couplers in the line and then moving them saved a little time. It was also found that the most efficient method of moving sections of pipe in high corn was for each man to pick up a section and slog through the mud, carrying it either straight up in the air or by the riser, where the riser was at the balance point. They also found that this worked well with three-inch pipe in 20 foot lengths, but that it took an awfully good man to keep up this sort of work all day with heavier pipe. They decided that the best method in tall corn was for one man to carry a length of three inch pipe, but two men should work together on larger pipe. They found that cutting paths through the corn made it easier for the workers—it did not speed up the moving, but the loss of corn was so small it couldn't be measured and they concluded that the practice was worthwhile.

A scale map of the fields was made and the paths each man should take to do the job were plotted. At each point where a man changed direction a pin was placed. Later, string was strung on the map showing the path each man followed. The two strings were then measured and the work assigned to the men adjusted until the

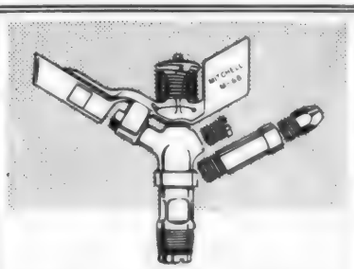
strings were approximately even. This was not an effort to be fair, square and humanitarian—it simply showed that if the plan were followed, one man wouldn't be standing around while the other worked.

In analyzing the results of the planning, Shull and his associates found that their biggest saving came from keeping both men busy all of the time they were on the job instead of following their very natural inclination to work together even on jobs one could easily do alone.

They also found that a great deal of time was saved by assigning responsibility for the details. Too often, under the old system, Shull found that such conversations were taking place: "Where's the end plug?" "I thought you had it!" "No, you must have left it back at the last setting; you'd better run back and get it." "Why don't you just run back yourself?" etc., etc.

Under the planned method, each man knew who was to pick up the end plug and who was responsible for carrying the pipe-lifting tool back to the starting place at the end of the setting and who was to check the oil in the pump engine and the packing on the pump.

Planning also brought other benefits. They found that in thinking over the job they were able to improve their whole technique. For example, they found that if they cracked the valve on a lateral and let a little water run through the pipe as they assembled the lateral, the water washed out any dirt that got into the pipe and saved time when it came to



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SPECIAL FEATURES

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- 2 nozzles for more water
- Use barrel extension to cover larger areas
- Rotating cap makes spring tension adjustment easy
- Neoprene bumper on the driving nozzle absorbs shock; assures long, trouble-free service.
- 4 to 22½ g.p.m. capacity

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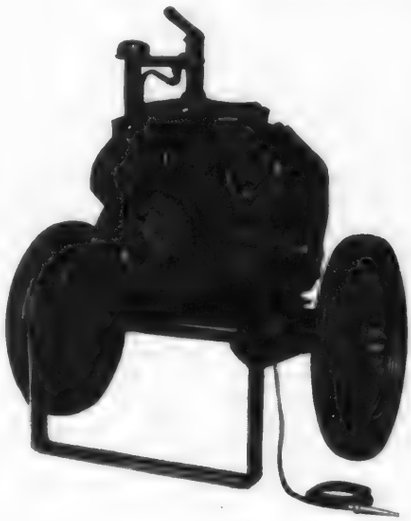
with MYERS PRESSURE Rain irrigation pumps



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COMPLETE LINE with capacity ranges up to 1,800 gallons per minute, pressures to 200 pounds. Eight engine-driven models. Skid or wheel mounted. Three models for flexible coupling or belt drive.

ENGINES—Air and water cooled. Can be furnished to operate on LP fuel or natural gas.

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Moves Lateral on wheels. One-Man Operation.

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Your Tractor moves entire Lateral from field edges!

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cleaning out clogged sprinklers. They also found that a definite routine for servicing the pump and engine added to the life of the equipment by preventing neglect.

Shull and his associates are sure that the kind of planning that saved over half of the labor of moving pipe, can be applied with good results to any irrigation work whether the farmer is carrying pipe by hand or moving it with the latest automatic machine. They feel that planning starts with the layout of the fields since their tests show that rectangular fields require less labor. In planting, it is best to plan the rows so that the lateral lines can be laid between rows on level ground. When planting on the contour, irrigation should still be on a rectangular pattern. If high crops are being watered on contoured land, pathways should be cut through the crops for the lateral lines.

In planning the work routine, Shull feels that the orderly approach suggested by Vaughn and Hardin in their book, *Farm Work Simplification,* is an efficient one (and since efficiency is the goal it should by all means be arrived at efficiently). This approach involved the following steps: (1) Break down the job, observe what you are doing. This means a listing of every last annoying detail of the job with the time it takes to do each task. Here is where a map of the fields with a string and pins to show travel would come in handy as a graphic tool. (2) Question every detail. As you unwind the string from the pins you might ask, "Is this trip necessary?" Can the job be done with fewer steps? Are there unnecessary trips because tools or end plugs are forgotten—not considered part of the job? Can parts of the job be combined—like washing out the line with a trickle of water as it is being assembled? Would any tools or devices help do the job quicker or better? (Such a device was used by a Missouri farmer in hand carrying when he found that he could rest the crutch used to hold up the pipe in his old American Legion flag staff harness.) (3) Develop the new method. After each part of the job has been analyzed and questioned, a new method of doing the job must be worked out. Here again the string, pins, and map will be of real help in testing the saving of different plans. Simply listing the jobs to be done in the order that they are to be done can be helpful—Shull found that when his workers memorized the job list they saved time because they so seldom forgot a tool or a detail. (4) Put the new method to the test by using it. After you've gotten used to the new way you may find that it has saved you time and labor. You may also find that making one change has suggested other labor saving ideas. The time that has been spent studying and organizing the job is an investment that will last the life of the irrigation system.

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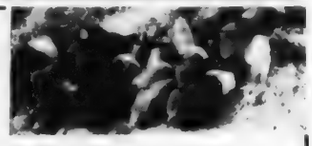

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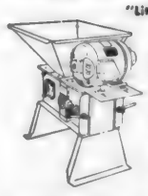

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CAN THE DAIRY FARMER CUT OUT THE MIDDLEMAN?

(*Continued from page* 57)

Walk-in Cooler, York
(Size 12 x 7 x 7)

Ice Bank Machine
(Makes one ton for use with aerator-cooler)

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(Stainless steel, sanitary type.)

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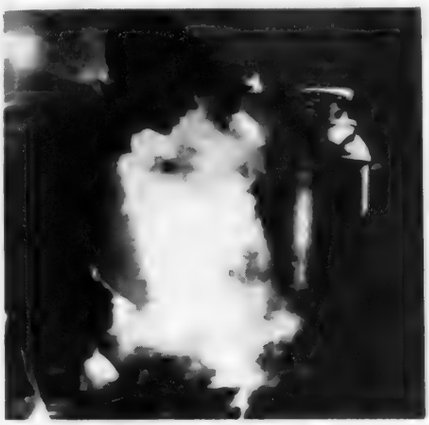
"We were fortunate to be able to buy, at a very good price, the essential pieces of processing equipment from an Ohio



Wash-up and sanitation in a dairy operation require a good supply of water approved by the Board of Health.

dairy farm show-place that discontinued operations after 8 months. Even so, the outlay was nearly $10,000 in round figures.

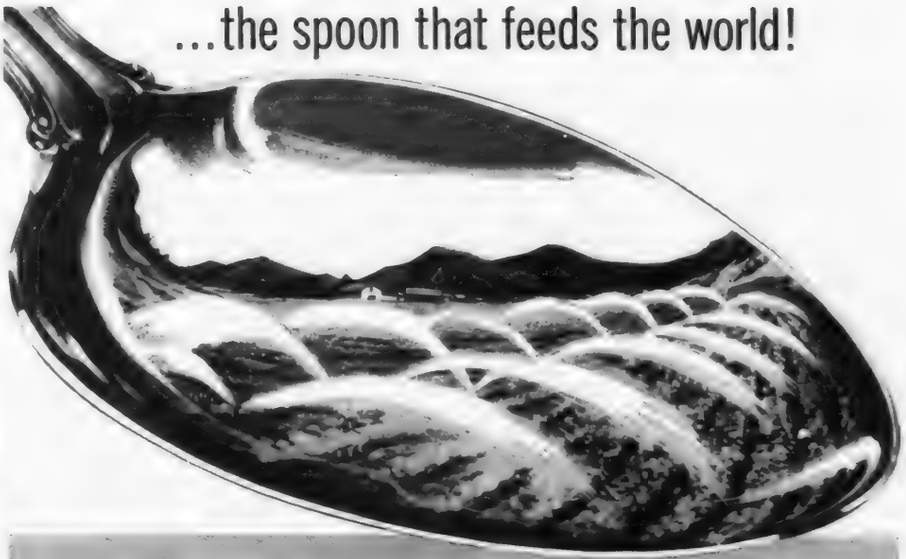
"To install all this equipment with sanitary pipe and to build a concrete building over your head, you can just about double this figure to get your final cost. We're handling 425 gallons of milk a day now, and we can process more as our sales increase. We buy milk from three other Guernsey producers now and that is why we need the receiving tank.

"To deliver the milk we use two refrigerated trucks with built-in mechanical units. One is a Divco, and the other is a Hermann body mounted on a Chevrolet 1½-ton chassis. Their refrigeration units are hooked up at night to our 220 volt electric line, which builds a good ice bank. Each truck travels about 50 miles a day, six days a week. Each driver has two routes and he covers each home with a delivery every other day. Either one of these trucks with the body will cost about $4,000 new.

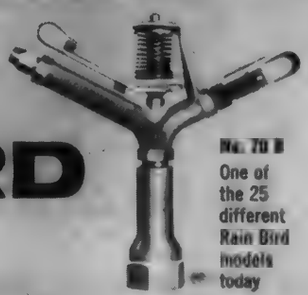
"Sure, delivery costs money but that is what the housewife wants—convenience—and milk is a perishable product that is best when it is fresh. I've heard it said that if you had to bottle and deliver water in quarts under the same sanitary conditions instead of milk, it would cost 12 cents a quart to put it on the housewife's doorstep. Our milk delivers at 21 cents for regular milk and 22 cents for homogenized."

Cost of production at Cedarbrook breaks

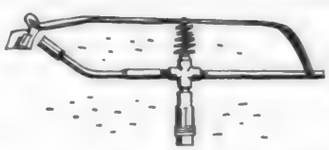
...the spoon that feeds the world!



built by
RAIN BIRD



No. 70 B
One of the 25 different Rain Bird models today



Original Rain Bird Sprinkler, 1933 model

Built in a barn in 1933, the first Rain Bird sprinkler was a crude affair . . . but it set the pace for modern irrigation. The swinging, spoon-type arm—originally shaped by hand—has made irrigation practical on all types of lands and crops. Rain Bird's swinging, spoon-type arm distributes water evenly over a maximum area. That's why Rain Bird sprinklers are used around the world . . . wherever irrigation can solve a nation's food problem.

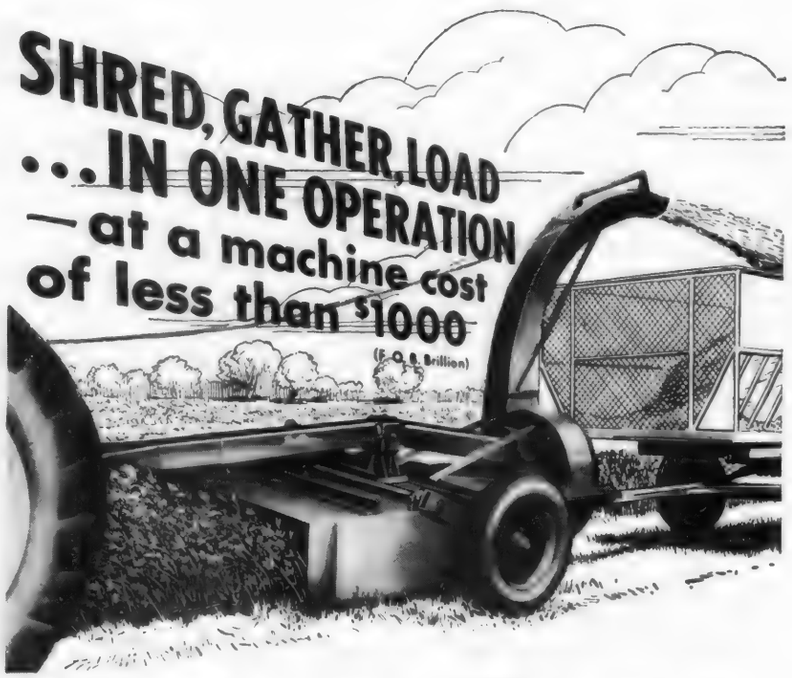
CONSERVATION! Rain Bird Sprinklers conserve soil and water as avidly—but with a better purpose—as a miser hoards his gold. They apply water uniformly over the entire field and, by controlling the length of time of operation, will apply water to the proper depth. Thus, Rain Birds save water, plant nutrients and fertilizers and eliminate alkali build-up on soil surface.

BETTER CROPS! Rain Birds increase production with their uniform application of water to the proper depth, promoting feeder root growth throughout the upper soil, thus insuring strong, more productive plants.

STILL THE LEADER! Today, more than 23 years of constant research and development are your assurance that Rain Bird is still the leader with the newest, more efficient methods of sprinkler irrigation. Insist on Rain Bird, the leader—accept no substitute—and be sure of dependable performance. *Remember, if it hasn't the name, it isn't the same . . . specify Rain Bird!* Also, be sure that the sprinkling system you get meets the standards set by the American Society of Agricultural Engineers and fits your needs exactly.

See your Rain Bird dealer today . . . or write to the nearest Rain Bird office listed below for helpful literature—no obligation.

NATIONAL **RAIN BIRD** SALES & ENGINEERING CORP. Azusa, California
RAINY SPRINKLER SALES
Division of L. R. Nelson Mfg. Co., Inc., 609 W. Lake St., Peoria 5, Illinois
RAIN BIRD SPRINKLER MFG. CO. (CANADA) LTD.
54 East Cordova Street, Vancouver 4, B.C.



You can do it with a *Brillion* Cut-All and new Cobra-Head Blower

Ideal for bunk feeding... cutting and gathering bedding... shredding before plowing

Now... 3-way utility with Brillion Cut-All Shredders. One machine to do the work of a shredder... the gathering and loading of a forage harvester—in a single, low-cost field operation.

Brillion Shredders do it with the new, Cobra-Head Blower. A big, 30" diameter fan attaches to the shredder housing and drives off the power take-off — no belts. It picks up and loads heaviest bedding or feed crops, without flailing. Gives you a cleaner crop — saves leaves — minimizes dust and dirt.

And for shredding heavy crops before plowing, you get proved Brillion shockless shredding... all the tractor protection of friction-slip clutch-blade control. Handle your heavy corn and cotton stalks ... saplings, brush, orchard prunings... grain stubble or combine straw ... with no more strain on the tractor than a PTO mower.

The Cobra-Head Blower attaches to all Brillion Cut-All Rotary Shredders at low additional cost. Your Brillion dealer has all the facts. See him soon.

Brillion
CUT-ALL ROTARY SHREDDERS

IF BRILLION MAKES IT, IT *MUST* BE GOOD

Standard Cut-All Shredder ... 5-ft. cutting width—2 sets of 2 blades independently controlled by friction-slip clutch.

Pick-up Cut-All Shredder ... fits all tractors having standard 3-point hitch. Exclusive Brillion slip clutch.

Offset Cut-All Shredder ... lets you drive clear of branches while Shredder works close to tree row.

Clip and mail to Brillion Iron Works Inc., Dept. CH-3-6 Brillion, Wisconsin
Send me complete information on the Brillion Shredder I have checked below:
☐ Cobra-Head Blower ☐ Pick-up Cut-All ☐ Standard Cut-All ☐ Offset Cut-All
Write your name and address on the margin

down to 8 cents per quart for the raw milk (this figure is estimated because the new loose housing, milking parlor set-up has not been in operation long enough to get a firm cost figure); 5 cents for processing and bottles; and 6 cents for delivery, leaving an operating profit on quart milk sales at 2 to 3 cents.

"When our sales reach 1,000,000 pounds of milk per year we think that our combination of modern, low-cost production through loose herd housing and the clean modern processing of high quality milk and cream will be at its most efficient best. Then—and only then—we hope to realize an operating return of about 9 per cent, which figures at $1 per 100 pounds of milk profit in retail sales, or $1 on 50 quart milk units."

The Roadside Salesroom

The answer that a number of dairy farm processing plants have found to the delivery problem has been roadside dairy bars. (See FARM QUARTERLY, Summer, 1954). It the plant is on a heavily traveled highway, the customers can be brought right to the door.

Deciding whether to go into a vertical dairy operation requires careful consideration. These are the questions you should ask yourself and know the answers to:

(1) Is there room in the market for another brand of milk?

(2) Can I create a new market, such as has been done with roadside dairy bars?

(3) Do I have the milk production to make the purchase and operation of expensive processing equipment pay off? Fixed costs and depreciation are present whether you process 10 quarts a day or 10,000.

(4) Do I have the labor supply in my own family or near my own farm to take care of this new 6-day a week operation?

(5) Do I have the water, electricity, needed to operate dairy equipment?

(6) Do I have the money to go into the operation and stay afloat financially until I get the market volume to a point where I will be able to make a profit?

A complete vertical operation is being carried on by many dairy farms and they are making money, but they invariably have the type of management that was making money with a dairy farm before they went into processing. More efficiency per man with automatic and time-saving equipment, and higher production per cow are the essentials for any kind of dairy operation today.

the sale that's never forgotten!

...because it's *registered*

Here is what *Registered* SHUR-RANE means to you:

You can be positive that your SHUR-RANE Sprinkler Irrigation System is correctly designed to your farm and that it will do a fine job for many years. But, that's not all! When you have problems on how to use it, *you receive help.* When you need parts or additions, *they are ready.* When you need service, *it's there.* When you need specialized information, *you can get it.* New techniques and developments *are made available to you.*

You can depend on your SHUR-RANE dealer because he is selected and trained by an old, well-established firm and he will build his future with you.

Your SHUR-RANE dealer offers you the most advanced couplers and fittings on the market and selects for your exact needs from the most complete line today. Every part is warranted.

When your SHUR-RANE dealer delivers your registered system, you can be sure that it is ready for years of work at top efficiency.

PAY OUT OF PROFITS!

Only SHUR-RANE has a national financing plan that lets you buy *now*, pay *later.*

REGISTERED SPRINKLER IRRIGATION SHUR-RANE

SHUR-RANE Department FQ
FOOD MACHINERY & CHEMICAL CORP.

Gentlemen: Please send me complete information on REGISTERED SHUR-RANE SYSTEMS.

Name_____

Address_____

City_____ State_____

Farmer_____ Student_____ Other_____

Mail to nearest factory—
John Bean Division, San Jose 1, Calif.
John Bean Division, Lansing 4, Mich.
Florida Division, Lakeland, Fla.

Other FREE Booklets Available:

- ☐ What you should know about sprinkler irrigation
- ☐ How to choose a sprinkler irrigation system

Sprinkler irrigation is:

- ☐ Fall irrigation
- ☐ Grains ☐ Corn
- ☐ Pasture ☐ Orchards
- ☐ Cotton ☐ Row crop
- ☐ Fertilizer

"FARMING IS EASIER
with an Eaton 2-Speed Axle"

...says Farmer Harold Schuster, Huron, Ohio

"AROUND my 350 acres," says Harold Schuster, "there's plenty of work for a truck. I've got to take out grain and sugar beets, get my hogs and Holsteins to market. For fast, dependable performance in the field—plus safe, swift hauling on the highway—I can count on my Eaton 2-Speed Axle.

"Even after a heavy rain, when the land turns as soggy as a wet sponge, my Eaton-equipped International truck really does a job. With Eaton's low-gear range, I get extra pulling power to move a heavy load over muddy ground—without bogging down and losing time. I take out more payloads, hustle them to market promptly.

"When I hit the highway, I use the Eaton high-gear range. That gives me top legal speeds without overworking the engine —or wasting gas. Hauling takes a lot less time now, and my trucking costs have been cut to the bone. There's nothing that equals an Eaton 2-Speed Axle."

Find out today how an Eaton 2-Speed Axle can speed your work, save you dollars. Ask your dealer for a demonstration.

"TIME-SAVING, TROUBLE-FREE TRIPS—that's what we need, and get, with an Eaton 2-Speed Axle," says Harold Schuster. "With my truck rolling at fast legal speeds, Eaton's high-gear range keeps down engine RPM. Maintenance is less; motor life is longer. And Eaton's easy shift means less tiring trips for the driver."

INTERNATIONAL TRUCK DEALER Robert Jones, President of Hartley Truck and Implement Company in Berlin Heights, has sold many Eaton-equipped Internationals. Reports Bob Jones: "One demonstration convinces a prospect that he needs an Eaton 2-Speed Axle. No other axle can match it for field-and-highway utility."

PAR

PROJECT ADEQUATE ROADS: America has outgrown its overcrowded highways. Speak up in your state for more and better roads.

MORE THAN 2 MILLION EATON AXLES IN TRUCKS TODAY

EATON

EATON MANUFACTURING COMPANY, CLEVELAND, OHIO

2-SPEED TRUCK AXLES

(*Continued from page* 47)

violets? Or take the kids to a swimming pool to keep them off the streets? Once we took the kids to an airport to see the jets take off. But they couldn't take their eyes off a couple of horses in a nearby field. Here on the farm the pets they tend and play with now will be part of the herd in a year or so.

"We don't turn the babies over to baby-sitters. When we visit, the kids are part of the party. We see a lot of the neighbors. Good neighbors are a blessing to a farmer."

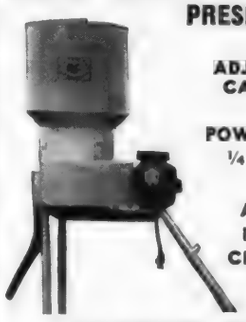
To Each His Own

"I couldn't stand being cooped up," Ed Gilfilen gives as his reason for farming. "Here I am with my own family twenty-four hours a day, with plenty of elbow room. I'm free, free to work myself to death if I want to, free from being a number on a punchcard, free to make my own decisions. It's the kind of freedom they call 'feeling easy in your harness.' No farm job lasts long enough to get tiresome. By the time the corn is laid by the wheat is ready. When you run your fingers through your own wheat in the bin, you forget the labor and the burn of fertilizer dust in the cuts on your hand.

"A man has to have faith. When you go out at sunrise on a May morning and the sod springs under foot and you hear the sparrows waking in the hedge, you get that faith; you know then that every calf and bird and tuft of clover are part of a thriving concern. You either feel it or you don't. If you don't feel peaceful inside when you're walking through the corn on a Sunday afternoon on your own land, you better move to town."

Work often becomes a kind of passion to a farmer. He doesn't feel right at the end of a summer day unless he's tired. There're the peeled knuckles from grubbing along the roadside and the water freezing on his cuffs at the stock tank in winter. There's a stretch of months when he has rubber boots on more hours than not and it seems like there never was any dry ground under foot. There's the sudden April rain that drenches his skin and squinches through his shoes. In summer

METER YOUR GRASS INSILAGE PRESERVATIVE



ADJUSTABLE CAPACITY

POWER: ¼ H.P. ELECTRIC

AVAILABLE IN PORTABLE OR CLAMP-ON TYPE

PALSGROVE MFG. CO.
CANAL WINCHESTER, OHIO

You can take your irrigation system anywhere . . . if it's USS NATIONAL* PLASTIC PIPE

*TRADE-MARK

Flexible • Lightweight • Easy to Cut • Easy to Join

It's common knowledge that controlled irrigation can give you a longer growing season—bigger, better, earlier crops, a double or even a triple yield.

But do you know how easy and inexpensive it is to have your own irrigation system?

USS NATIONAL Polyethylene Plastic Pipe unrolls like hose. You can carry a 200-foot coil of two-inch on your shoulder, since it weighs only 86 pounds. It cuts smoothly and quickly with a hacksaw or carpenter's saw. The fittings are of the insert type, secured with removable stainless steel clamps. No adhesive is used. A screwdriver is all you need. Ells, tees, couplings, reducers, valves, and threaded adapters for joining plastic to steel pipe are available.

You can run flexible NATIONAL Polyethylene Plastic Pipe around corners or over obstructions. It's the all-weather pipe—retains its flexibility and toughness over its entire working range from minus 90°F. to plus 120°F.

USS NATIONAL Polyethylene Plastic Pipe resists attack by corrosion and a wide variety of acids, alkalies, salts and other chemicals. It won't crack or break, even at very low temperatures. And due to its smooth interior surface, it offers very little flow resistance to the liquid passing through it. And remember — only 100% virgin "on grade" polyethylene material is used in its manufacture.

NATIONAL Polyethylene Plastic Pipe is available in sizes from ½-inch to six inches in diameter, in a variety of wall thicknesses. For more complete details, write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Ask for Bulletin No. 29.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

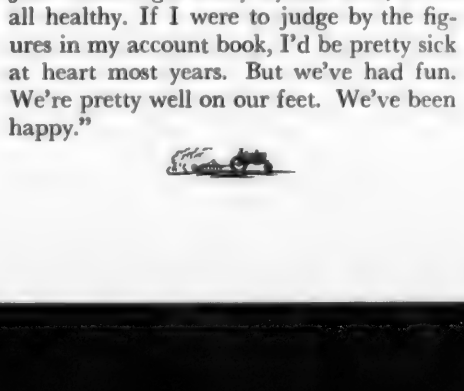
USS NATIONAL plastic PIPE

UNITED STATES STEEL

the straw scratches his arms and the chaff gets down his neck and raises a rash on his back. The salt sweat bites into the rawness under his belt in July. Any day can bring a crisis. A hopeful morning in May can turn into a tragedy with bloated cows stretched across the clover. There's the sinking feeling of watching a beef calf sell for $60 when it cost $80 to keep the cow over the year. "You want to give up right then," says Ed Gilfilen. "Or you say you'll quit next year. But you never quit. You go home to dinner and you slosh away the sweat and the tiredness at the yard pump. At the table you see the boys are getting bigger and that means more manpower coming along so you keep your eye on that extra acreage that you might someday be able to buy down the road. You know you'll never quit."

You don't find atheists in the country. You can't watch a field of wheat ripple and ripen without deep beliefs and without feeling that you're a small part of something pretty big and lasting. No man grows roses and cabbages for himself alone. You have to share to enjoy.

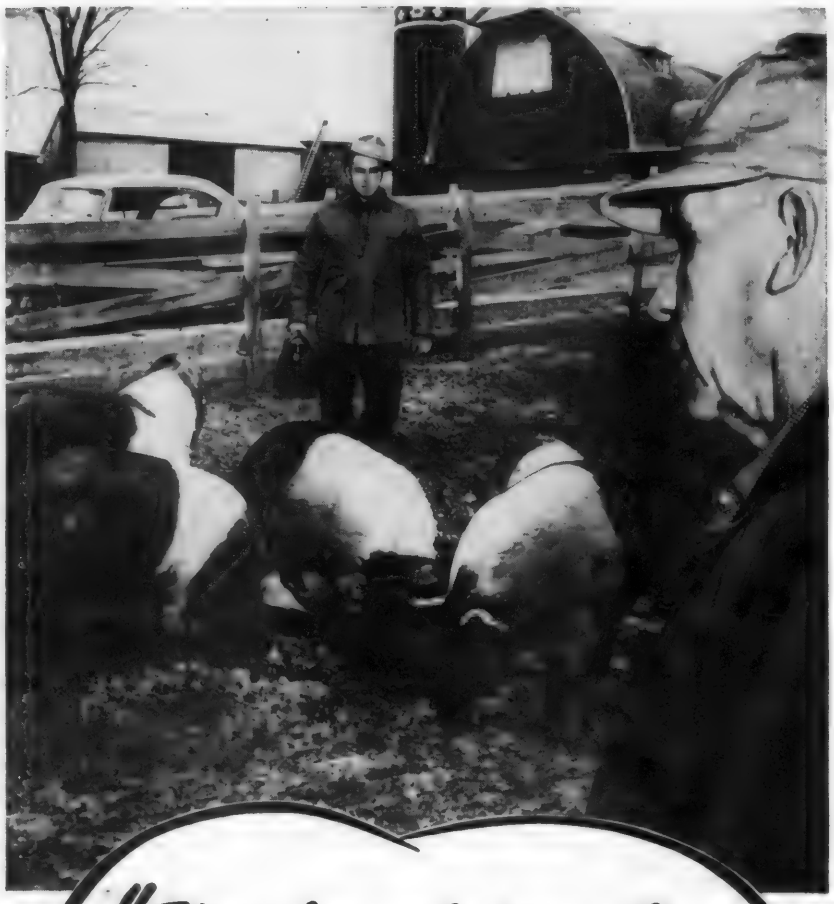
A farmer doesn't get sick leave or unemployment compensation. The work goes on. One year Ed Gilfilen cut his foot almost off on a scythe blade; another year he broke out with carbuncles. There hasn't been any vacation for the Gilfilens yet, except for Jane's annual spell in the maternity ward.



On a May morning a farmer's world unfolds.

"According to Ed," says Jane, "my hospital visit always comes at planting or haying time. And always after a false alarm or two. The older boys think it takes three trips to the hospital to have a baby."

The Gilfilens income is going up. Ed says, "We grossed $5165 last year, mostly from livestock, and we sold some wheat. Our net ran a shade over $2000, plus our living. It would take double that to raise our kids in the city. Those figures don't tell the whole story. Our corn is up to 90 bushels an acre since we limed and fertilized the fields. We've got 11 sows with 110 pigs right now, along with 8 head of beef and 22 sheep. It's a small operation by cornbelt standards, but it's a beginning. Each year we knock a slice off the mortgage on the 52 adjoining acres we bought several years ago. The ladino grows thick in every field. We dug a new pond. We don't owe a cent on our equipment except for the welder I bought on time. All the terracing we need has been done. Most of the buildings have been repaired or remodeled. Our next job is to add three rooms to the house. Of course, Jane doesn't get many nylons. Still, we're all healthy. If I were to judge by the figures in my account book, I'd be pretty sick at heart most years. But we've had fun. We're pretty well on our feet. We've been happy."



"They're doing fine now, Doctor"

"I'm certainly glad I called in a veterinarian when those hogs took sick. Things looked pretty serious, but the veterinarian diagnosed the trouble, knew just what to do, and now the whole herd is coming along fine.

"What a difference, compared to trying to diagnose things myself — and trying to 'dose' those sick animals. In the past I've tried that and lost. No more amateur methods for me."

When sickness strikes farm animals, it pays to call your veterinarian. He is trained to know. His careful diagnosis removes guesswork. His scientific methods of treatment can mean the difference between life and death. His science and skill pay for themselves a dozen times over in animals saved — and in better profits for the farmer.

This message in the public interest is sponsored by American Foundation for Animal Health

BUILDINGS FOR NEXT TO NOTHING

(*Continued from page* 63)

slight peak. When the jig was finished they began nailing on the cheapest, rough, one-by-four lumber they could buy—in central Iowa this was cottonwood. After the first layer was bent and nailed to the jig, a second was nailed on top and then a third and fourth until there were 12 layers of one-by-fours nailed to each other, forming a curved half-rafter 4 inches wide and 12 inches thick.

This half-rafter was then pried from the jig—it held its shape—and holes were bored through it at two foot intervals for ⅜ inch bolts to reinforce the nails. As soon as one was off the jig another was started until some 180 half rafters were finished. They were assembled into complete rafters by bolting two of them together with a strap iron tie and, since both halves were built on the same jig, they formed a perfectly symmetrical arch.

While one crew of men worked on the rafters, another joined forces to build the concrete floor. Though these floors look like a simple slab, there's more than meets the eye here. At the spot where each rafter was to stand, a steel strap was set with one end protruding above what was to be the floor level and the other fastened to a reinforcing rod. Every fourth rafter was provided with extra anchorage. This anchor consisted of a short rod which was fastened to reinforcing rods in the floor in such a way that it could be pivoted into a slot in the floor when not in use. A tie rod from the wall is fastened to this pivoted anchor when the building is to be filled with grain and is unfastened and swung out of the way of machinery when the building is emptied.

After the steel work was done, the 5-inch slab and 14-inch footings were

NETS $1.76 MORE PER CWT WITH

GOLDEN GUERNSEY

John C. Malley, owner of Indigo Hill Farm, Inc.
Somersworth, N. H.

Superiority of Golden Guernsey Milk made the big difference for Malley. Last year, he sold to a local dairy — low profit margin. Now, under the Golden Guernsey program—his own route, 600 qts. daily. Net: $1.76 more per cwt! Read Malley's story in *free booklet*.

Hurry! Send for FREE BOOKLET!

The American Guernsey Cattle Club
606 Main St., Peterborough, N. H.
Send free Guernsey booklet and other useful information.
Name.....
Address.....
Town..... State.....

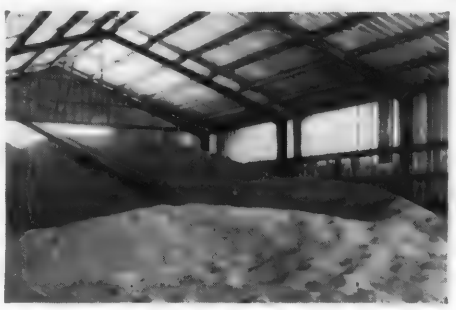
Store it flat at lowest cost per bushel

in BUTLER steel farm buildings

Economical. You get grain storage at less cost per bushel in pre-engineered Butler flat storage buildings than in any other type. Mass production lowers prices, insures uniform punching and forming of all parts for fast, low-cost erection.

Keep crops safe. Grain in Butler flat storage buildings is spread out, not piled deep. This allows in-storage drying with Butler Force-Aire equipment. Force-Aire helps prevent overheating, controls insect activity. Butler buildings are fire-safe, weather-tight, rodent-proof—keep crop-quality high for top prices, better feed and seed.

Never idle. Butler storage buildings perform a variety of farm uses when no crops are in storage. Big doors, pole-free interiors, straight sidewalls permit easy maneuvering of large machinery, spacious storage.



Weather-tight, rodent-proof Butler steel farm buildings keep every crop dry and in top condition.

Multi-use. No brace rods to the floor, no chuck holes. Ideal for machinery shelter when no crops in storage.

Ask your nearest Butler Builder for free booklet on Butler steel crop storage buildings. You'll find his name listed in the yellow pages of your telephone directory.

Force-Aire dries crops in storage. This permits you to harvest earlier, reduce field losses.

BUTLER STEEL PRODUCTS

BUTLER MANUFACTURING COMPANY

7378 East 13th Street, Kansas City 26, Missouri

Manufacturers of Steel Buildings

Oil Equipment • Farm Equipment • Dry Cleaners Equipment • Outdoor Advertising Equipment • Special Products

Sales offices in Los Angeles, Richmond, Calif., Houston, Tex., Birmingham, Ala., Minneapolis, Minn., Chicago, Ill., Detroit, Mich., New York, N. Y., Burlington, Ont., Can.

LOOK FOR THE ALCOA LABEL . . .

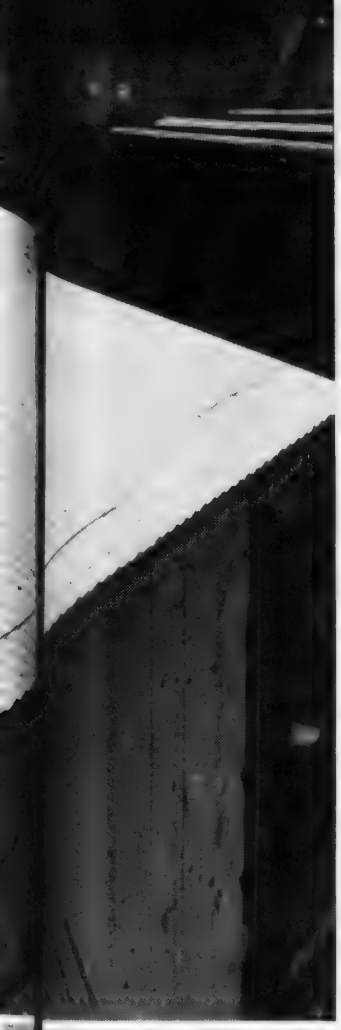
it protects you against inferior aluminum roofing

You can't beat Alcoa® Aluminum Roofing for *value*. It pays *immediate* dividends and it gives you those all-important, long-term savings.

Alcoa Aluminum roofs make buildings up to 15 degrees cooler. And that means higher, more consistent profits from poultry, dairy cows and other livestock. And, by using the popular pole-type buildings, you can save up to 75 per cent on building costs. Over the many-times-longer life of your aluminum roofing, you save on maintenance, painting, repairs.

When you buy aluminum roofing, look for the Alcoa label. It identifies the stronger, longer lasting *quality* aluminum roofing that means a better value. It's backed by 68 years of aluminum experience.

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS



LOOK FOR THE ALCOA LABEL . . .

it's your assurance of farm gates that can't rust, rot, warp, twist, sag or splinter

Any *new* gate can confine livestock. Alcoa Aluminum Farm Gates *stay* "new." Designed by Alcoa's own agricultural engineers, built in Alcoa's own shops, they end gate worries forever. Just hang 'em and forget 'em.

Your building supply dealer can provide these gates *now*. They come completely assembled, including hinges, screw hooks, latch chains. Available 52″ high by 10′, 12′, 14′, 16′.

LOOK FOR THE ALCOA LABEL . . .

it stands for pipe that's tougher, stronger, longer lasting

Regardless of who makes the portable aluminum irrigation system you buy, make sure you get the extra protection afforded by the Alcoa label.

Only pipe identified by the Alcoa label is backed by the thorough-going testing of the world's greatest aluminum testing laboratories. Only Alcoa Pipe is made of a superior heat-treated alloy that takes rougher handling. And Alcoa Pipe has a smooth inner surface that permits higher flow rates at given pressures.

Because farmers have confidence in the Alcoa label, more Alcoa Pipe is in service than any other. And, because *dealers* believe in Alcoa, you'll find more of them displaying the Alcoa identification than any other brand.

Member of
SPRINKLER IRRIGATION ASSOCIATION

ALUMINUM COMPANY OF AMERICA
2071-F Alcoa Building, Pittsburgh 19, Pa.

Please send complete information on the following:

☐ Farm Roofing ☐ Irrigation Pipe ☐ Farm Gates

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Address_____

Post Office and State_____

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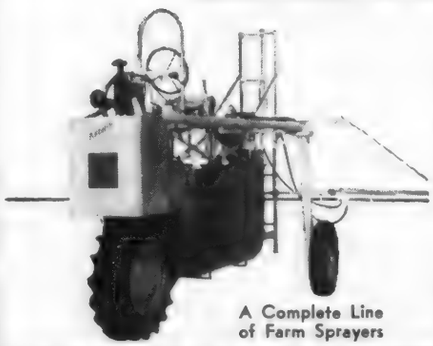
3 NEW
RIGID FRAME STEEL BUILDINGS
30'-40'-50' SPAN
FOR EVERY FARM USE
WRITE FOR FREE LITERATURE
USF
USS STEEL
UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO

KROMER HY-ROW SPRAYER
Spraying - Fertilizing

A Complete Line of Farm Sprayers
Increase your harvest yield—corn, small grains, beans, cotton, tobacco, hay crops—with a Kromer self-propelled Hy-Row Sprayer. Kromer has ALL the latest sprayer features—and ONLY Kromer tanks and booms are corrosion-proofed with the EXCLUSIVE Finish "X" process! Guaranteed not to rust!
Write today for free 20 page catalog describing complete line of KROMER Sprayers. Dept. 613
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A DARLEY IRRIGATION PUMP
PAYS FOR ITSELF IN ONE SEASON
And you can select the model best suited to your work from the complete line of Darley pumps ranging in capacity up to 1500 gallons per minute. All built over-size for top performance. Engine (gasoline, LP fuel or natural gas) or electric drive on pumps only. Also diesel.
With all these features you get only in Darley Pumps—Automatic Dry Prime, Patented Impeller Design which neutralizes end thrust, Automotive Splines in Pump Shafts, Pump Casings Adjustable for Direction of Discharge (rotate around shaft axis).
Manufactured by W. S. Darley & Co. (established 1908), makers of fire pumps used the world over. Our successful experience as pump manufacturers brings you highest obtainable efficiencies, built-in long life, adaptability and lowest cost consistent with mechanical and functional excellence.
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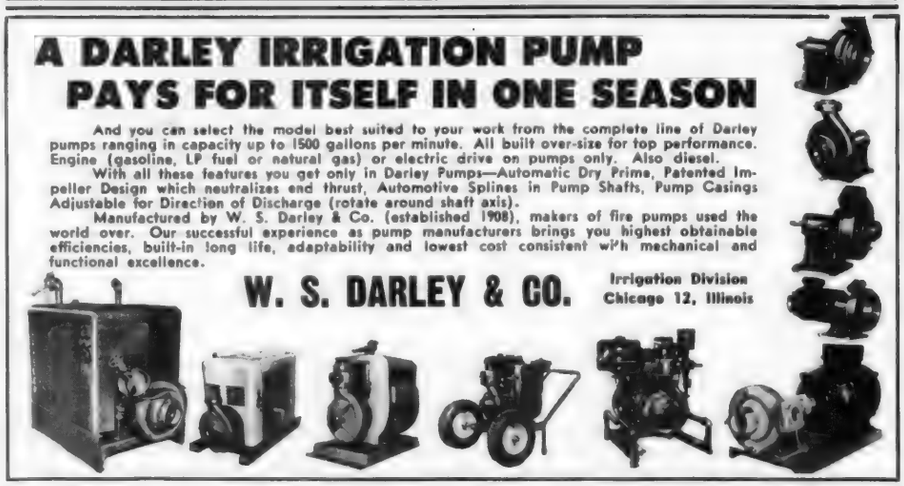

Money Saving Equipment For . . .

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This new, high speed, low cost method of fertilizing is growing rapidly. It offers you an opportunity to establish a profitable business in your community.
To assure your success, use Acme Fisher corrosion resistant equipment . . . it is trouble-free and will last much longer. Ordinary metal equipment will corrode quickly and eat up your profit.
Write for free bulletin about profitable handling of Liquid Fertilizer.
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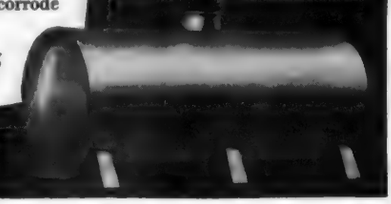

ACME FISHER DIVISION
BROADWAY RUBBER CORP.
728 S. 13th ST.—LOUISVILLE, KY.

poured. A pre-mix cement was used. Then the combined labor force of the three farms raised the rafters and bolted them to the steel anchors. At this point, each farmer took over and finished his own building, nailing on the lumber sheathing and the aluminum skin.

"We started the buildings right after corn was laid by," Bell said, "and had them finished right around the middle of September in time for grain sorghum harvest. Roughly the costs were $738 for steel, which included reinforcing steel, bolts, and nails; $1,889 for lumber for the rafters, sheathing, for the forms, the doors, and for trucking; $1,734 for aluminum; $1,046 for concrete; and $586 for the ventilating fans and movable air ducts."

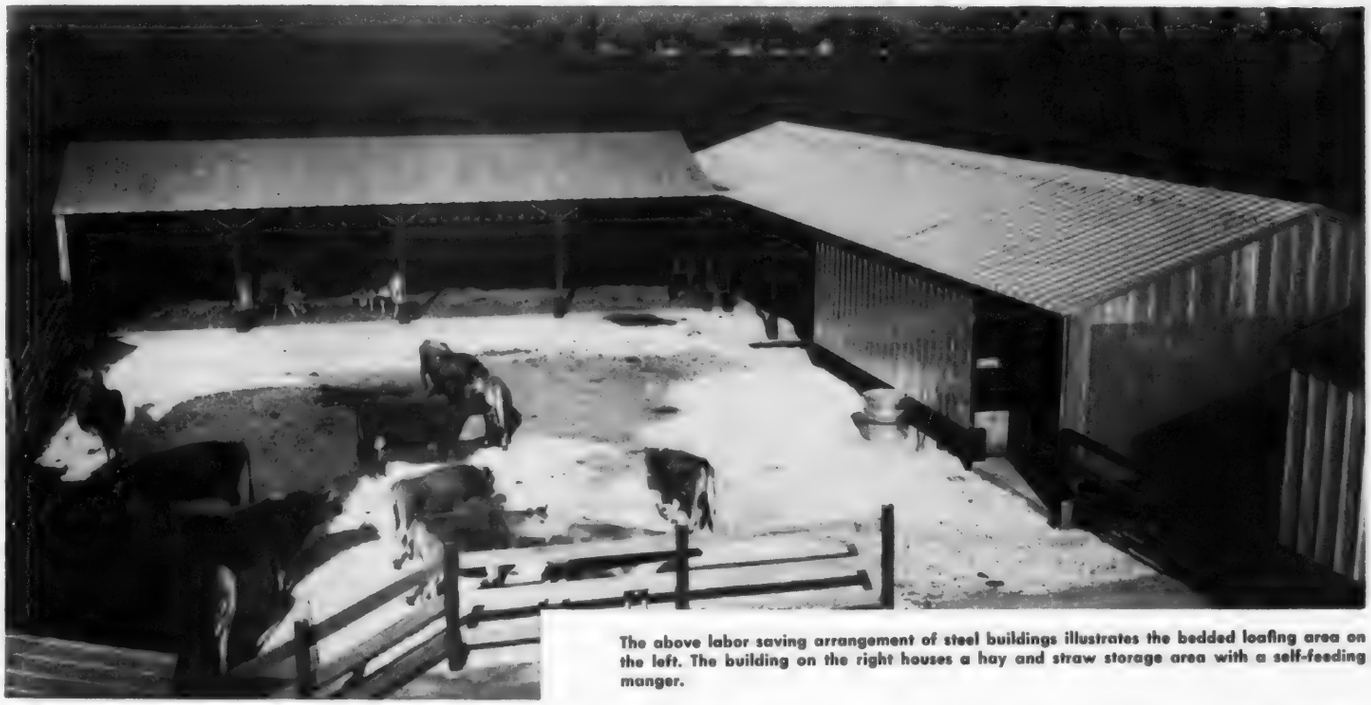
In this tight building the grain is kept in condition by two exhaust fans connected to movable half-cylindrical air ducts along the floor. These fans are not powerful enough to dry grain, but they can materially cool it by pulling air through it. Fumigating the grain is a simple process of pouring the liquid fumigant on top of the pile and pulling the gas through the grain by the fans.

Steel Buildings

One of Jake Bell's neighbors who was keenly interested in the building project was Ed Reid. Though Reid believed that building grain storage under present conditions made sense, he just didn't have the labor to put up his own building. "My solution was to buy a prefabricated steel building," Reid said. "The dealer did the whole building job—poured the concrete floor, erected the building, and installed the ventilating fans—and she is a beauty. One advantage of this building is that it is movable. I probably would never want to move it, but if this were rented land instead of my own I would have a hard time getting an A.S.C. loan on a permanent building—on a movable building I wouldn't run into any trouble."

Reid's building was completed in time for the 1955 corn harvest. He took a government loan of $1.52 a bushel on 26,000 bushels of corn and then went out on the open market and bought corn for feeding his beef herd. He paid around $1.24 for corn. This year, the Government has announced a resealing program for corn and Reid will reseal his corn, which occupies 60 feet of the 120 foot building, collect 15 cents a bushel on it and still have space for his 1956 crop.

"This building cost $16,000," Reid said. "But I didn't put up that money. The A.S.C. loan came to $12,800 at 4 per cent interest and I put up $3,200. Now let's see if it will pay off. I averaged a saving of 28 cents a bushel on the corn I fed over the loan on the corn I raised; that comes to $7,280 for 26,000 bushels. Resealing that same corn will bring in 15 cents a bushel this year which will amount to $3,900. I'll store another 20,000 to 26,000



The above labor saving arrangement of steel buildings illustrates the bedded loafing area on the left. The building on the right houses a hay and straw storage area with a self-feeding manger.

Modernization with Factory Built Steel Buildings

pays off handsomely for dairy farmer Ross Griffith of Galesburg, Ill.

Combination Milking Parlor—Milk House Building: contains a three-stall "U"-type milking parlor and a roomy, well ventilated milk room. In addition to the above three buildings, the Griffith farm has a Factory-Built machinery storage building.

By installing Factory-Built Steel buildings for a loose housing system, Mr. Griffith has changed from a Grade C to a Grade A dairy operation—and now in less chore time than he formerly spent, he can handle twice as many of his registered Jerseys.

The use of versatile steel buildings, fabricated from USS Galvanized Steel Sheets with USS Structural Steel framework, makes this economic, time-saving operation possible. The clear span construction permits the use of mechanical equipment for manure and hay handling. Hay and silage are self-fed and concentrates are fed from hoppers in the insulated steel milking parlor.

See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

USS

WHEN YOU WISH TO MODERNIZE AND ACHIEVE THE SAME PAYOFF, THEN

SEND THIS COUPON FOR FURTHER INFORMATION

Agricultural Extension
United States Steel Corporation
Room 5313, 525 William Penn Place
Pittsburgh 30, Pennsylvania

I am interested in steel buildings for the following:

☐ *dairy barns* ☐ *hay storage* ☐ *machinery storage*
☐ *cattle shelters* ☐ *grain storage* ☐ *poultry houses*

☐ *other* .....

Approximate size or capacity .....

Send information to:

Name .....

Address ..... Town .....

County ..... State .....

United States Steel Corporation produces high-quality USS Galvanized Steel Sheets and Structural Steel which our customers manufacture into durable farm buildings. Your request for information will be forwarded to the manufacturers of these buildings, and you will hear directly from them.

UNITED STATES STEEL

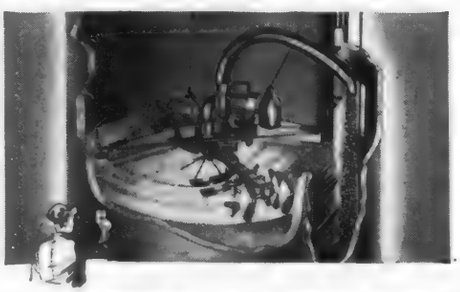
POWER CHORING

cuts chore-time at the flip of a switch!

Just $24.00 to $33.50 a month buys Jamesway Power Choring equipment. Mechanize your chores . . . save time and labor . . . handle up to twice the cows.

BARN CLEANER

$243.00 down, $33.50 a month buys it. Saves up to 2 hours of back-breaking work daily. Jamesway Shuttle-Stroke Cleaner costs less to install, own and maintain. Fewer parts are in gutter where wear is greatest. Fits any barn or stall arrangement.



SILO UNLOADER

$231.00 down, $31.00 a month! Saves 200-400 hours a year. Twin-Boom, Level-Cut action skims silage off evenly — frozen or unfrozen. Handles grass or corn silage. Breaks up chunks, aerates and mixes silage thoroughly to improve palatability.

CATTLE FEEDER

Yours for $175.00 down, $24.00 a month. Patented Shuttle-Stroke action delivers any feed to farthest end of bunk. No gears, chains or sprockets in bunk to wear out or clog in freezing weather. Perfect "push-button" companion to silo unloader.

POWER VENTILATION

Low monthly payments let you install automatic ventilation in your farm buildings. Boosts milk production by as much as 5%. Extends building and equipment life by up to 20%. Frame, guard protected from fumes and moisture by hot-dip galvanizing.

Your Jamesway dealer is the man to see for all your modern chore-saving needs!

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POWER CHORING

Mail this coupon for Free literature on Power Choring equipment as checked:
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☐ Cattle Feeder; ☐ Power Ventilation;
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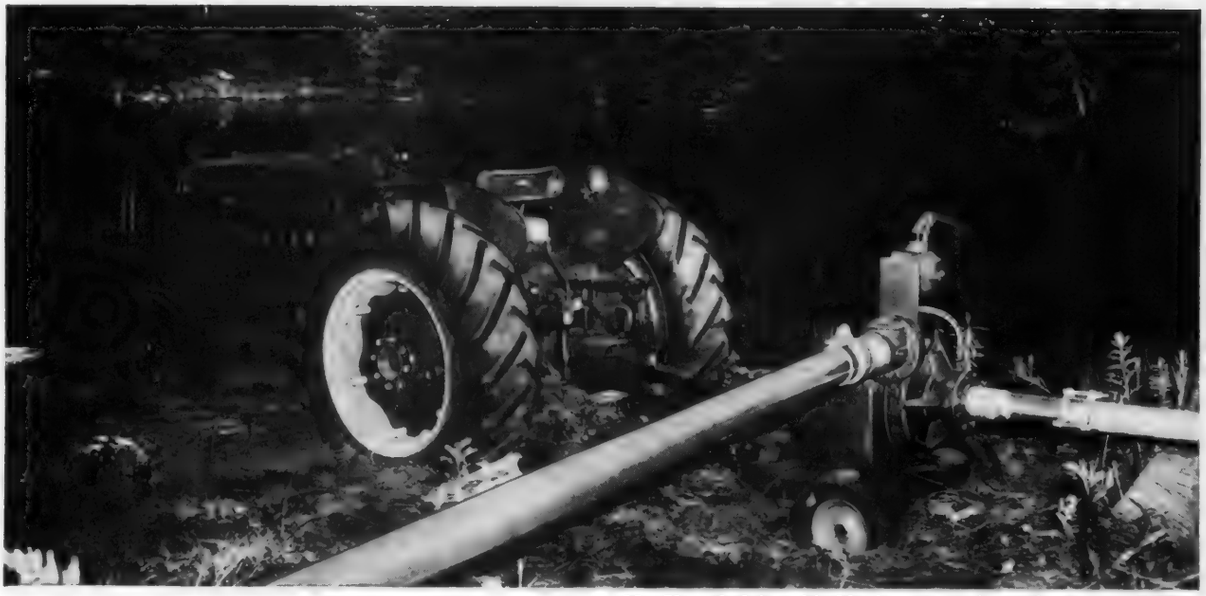
bushels this year in the front half of the building and buy feed corn and that, unless things are changed drastically, should be a big enough price spread to pay for the building. In addition to that, I am able to write off $3,200 of the cost of the building on taxes for five years.

"There is a drawback, though. I am responsible for the grain in storage and I've got to see to it that it doesn't get out of condition. That's a risk I'll take without feeling that I'm living dangerously," Reid said with a smile.

"Another point that some people raise," Reid continued, "is the matter of shelling and drying the corn for storage in this building. Here's the way I look at that. I built a regular corn crib a few years ago that will hold 6,000 bushels of ear corn. It cost me a dollar a bushel to build and I suspect that I'm not counting my own labor when I figure it that low. The new steel building cost me 28 cents a bushel to build. That leaves 72 cents a bushel for shelling and drying equipment. I bought a sheller to go on my two row picker and found that it is paying for itself by saving the time of one man. I used to have one man running the picker, one hauling wagons back to the crib, and one elevating and drying. Now, one man drives to the field in the truck and picks and shells 250 to 300 bushels of corn in three hours. He dumps it into the truck and hauls it to the batch drier where another man dries it and augers it into the storage building. The drying and the picking take about the same time, so we have saved a man there. We've found that drying shelled corn costs us around 3 cents a bushel where we spent from 6 to 10 cents drying ear corn.

"So, now I have a good versatile building that will last me a lifetime," Reid concluded. "It will have more than paid for itself in two years; and it's made us more efficient farmers to boot. As far as I can see, 'most any farmer can do the same thing we've done here at Coon Rapids. In some parts of the country, grain can not be stored safely for more than a year; even in safe storage areas, the government may not have a resealing program. This will cut down the returns, but it shouldn't do more than slow down the program a little."

There are those who feel guilty about the something-for-nothing aspect of this deal. They needn't. The program has deliberately been made attractive in order to tempt farmers to build storage space. The same thing is done when we want industry to expand—when we needed more nitrogen, the government offered industry a five-year write off on their tremendously expensive plants. So the man who gets off his tractor seat and starts building is not a sharper, he's just sharp.



Mr. Horeth drives his Marlow pump from the tractor PTO.

$4,860^{00}$ More Per Year—With Sprinkler Irrigation

AREA RECORDS OVER A THREE YEAR PERIOD SHOW THAT IRRIGATED TOBACCO PRODUCES $162.00 MORE PER ACRE!

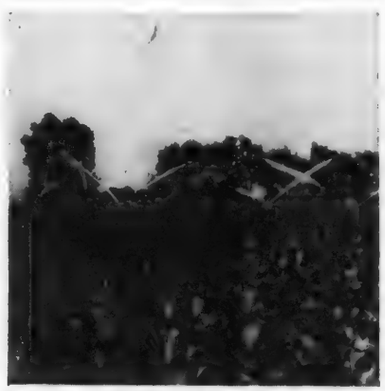
MARTIN HORETH has a 150-acre farm located near Aylmer, Ontario, in the heart of the large tobacco producing area north of Lake Ontario. During previous years, his crops suffered severely as a result of droughts which usually occurred between early July and mid-August, the critical period for tobacco.

This year Mr. Horeth decided to irrigate and installed a system which was planned by Spramotor Sales & Equipment, Ltd., of London, Ontario. It consisted of 3000 feet of 5-inch main, 1200 feet of 4-inch lateral, 20 sprinkler heads with 1/4 x 3/32 nozzles and a Marlow pump designed for operation from the PTO of his tractor. The pump is equipped with a geared speed increaser to build up the PTO speed for efficient pumping. The pump itself, mounted on two pneumatic-tired wheels, is easily towed into position behind the tractor. A diaphragm hand-primer quickly primes the pump.

Mr. Horeth pumps water from a nearby stream through the 5-inch main into two 4-inch laterals each 600 feet long. Ninety pounds pressure at the pump permits the use of 20 sprinklers at one time. Based on area records of $162.00 more per acre with irrigation, Mr. Horeth's 30 acres planted in tobacco will bring him an increase in income of $4,860.00 this year.

Many case histories like this prove that you can increase your yield with sprinkler irrigation. It is important, however, that the system is properly planned. See your Marlow dealer. He is an irrigation expert and will plan a system suited to your land and crops. Write for free literature today.

This Marlow Model 4E3SG PTO Pump has a dependable, geared speed increaser that assures proper speed for efficient pumping.



Twenty sprinkler nozzles are operated at one time to bring life-giving moisture to this tobacco crop on the Martin Horeth farm near Aylmer, Ontario.

Marlow PUMPS

MARLOW PUMPS

Division of Bell & Gossett Company

RIDGEWOOD, NEW JERSEY

Morton Grove, Illinois Longview, Texas

It's New, It's Safe, It's Effective!

Pyrenone* LIVESTOCK SPRAY

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SAFE—Niagara Pyrenone Livestock Spray is a newly developed non-poisonous and non-hazardous spray. Safe to use on dairy cows, as well as all other animals.

KILLS ON CONTACT—All varieties of flies, also mosquitoes, gnats, lice and many other insects and parasites.

EASY TO USE—Apply to animals, barns, grounds through any type sprayer. Ready to use.

ECONOMICAL—Only a very small amount needed for good control. Further economy results from its utility as an *all-purpose insecticide* for a wide variety of farm livestock needs.

Get Niagara Pyrenone Livestock Spray now at your dealer or order from your Niagara field man.

Niagara CHEMICAL DIVISION
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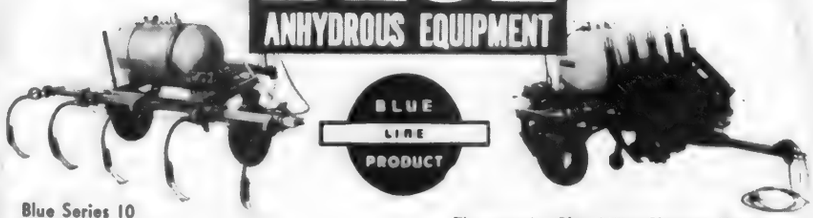
choose- BLUE ANHYDROUS EQUIPMENT



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The ideal machine for your row crop or broadcast application

The popular **Blue Nitro-Shooter Universal** slices turf, shoots in the proper amount of nitrogen and seals the surface.

We have a trailer or tractor mounted applicator for every purpose, row crop or pasture.

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Send for Complete Information

JOHN BLUE COMPANY, INC.
HUNTSVILLE, ALA.
DEPENDABLE FARM EQUIPMENT SINCE 1890

THE DIRTY FLY

(*Continued from page* 75)

The Tools at Hand

The methods of chemical fly control that can be used for farms and ranches can be divided for clarity into these categories:

Ready to use oil base sprays:

The oldest type of fly killing material. Usually a knock-down spray; it must be used in closed-in space of barns twice a day for a reasonable amount of fly control. Can be used in hand-sprayer.

J. C. Keller of the USDA Entomology Research Branch at Orlando, Florida, feeds the resistant strains of flies that are raised in cages in the laboratory. As strains of flies become resistant to one insecticide, they are given further checks with other chemicals.

Use on animals *with care* and according to directions. Most ready-to-use sprays are safe. Cost, about $1.75 a gallon.

Water mixed sprays:

Emulsifiable concentrates:

Many of our best and safest fly control chemicals are available in this form. Used in hand-sprayer or electric fogging machine as both knock-down and long time protection for buildings and animals. Water is added by user which saves paying the freight on it. Cost, $8 to $15 per gallon of concentrate which makes 9 to 15 gallons of spray. Actual spray costs $1 to $2.50 a gallon.

Wettable powders:

These have many of the advantages of emulsions, but require considerable time to mix. Cost, about $2.00 per lb. bag

MELROE

Prepare better seed beds for bigger yields! Drawbar rides on wheels, folds for easy access thru the narrowest field entries, one man operation. Coil-spring teeth of Melroe Harrow Section penetrate deeper without powdering top soil. Write for free, illustrated literature—dealer inquiries invited.

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all-around time and labor saver...

the John BEAN ROYALETTE

multi-purpose high pressure sprayer

1. Spray fruit trees
2. Control livestock pests
3. Control mosquitoes around yard
4. Apply liquid fertilizers, control weeds
5. Spray row crops
6. Disinfect poultry houses
7. Clean dairy barns
8. Control brush
9. Control road dust
10. Whitewash buildings and fences
11. Clean farm implements
12. Control flies
13. Have emergency fire protection

No other equipment on your farm or ranch, excepting your tractor, can do so many jobs so well. The John Bean Royalette is equipment you'll use year around — a sprayer that will pay for itself many times over in hours of labor saved.

You'll value the Royalette's dependability, easy operation and low upkeep, too. Only the Royalette pump has lifetime Sapphite cylinders — so hard that spray materials can cause no wear. Pump pressures up to 400 lbs. are at your disposal — enough to drive through matted hair to cattle's hides, ideal for tough cleaning jobs, and ample for all types of boom and hand-gun spraying.

There's a wide range of Royalette pump and tank capacities to choose from; also a complete selection of spray booms and accessories. Ask your John Bean dealer, or use coupon below, to get details.

for the best news in sprayers, look to John BEAN

NEW

Hi-Crop

sprays high . . .
sprays low . . .
does the job fast.

NEW

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ATTACHMENTS

bring modern
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low cost fly control for dairy barns

one spraying of DIAZINON kills flies for 4-6 weeks

TWO OR THREE RESIDUAL SPRAYS OF DIAZINON WILL CONTROL FLIES ALL SEASON in your dairy barns and other farm buildings.

This is important to the contentment, welfare, and production of your herd, and to your profits. Many figures have been given, but agricultural experts estimate milk production losses due to flies at between 8% and 20%. This is a costly loss for your pocketbook.

DIAZINON, a product of Geigy research, is the most effective fly control chemical you can buy. Yet it is low in cost because of its long residual action. Since only 4 lbs. of the 25% wettable powder in 25 gals. of water is required to treat the average size dairy barn, fly control protection with DIAZINON amounts to only a few cents per day. Combined with good sanitation and management practices, DIAZINON provides an excellent fly control program. DIAZINON knocks flies down fast and is effective against strains which have become resistant to other types of fly control chemicals.

DIAZINON is relatively simple and safe to use. Simply cover all livestock feed and drinking fountains. Remove animals from building during spraying operation and keep them out for four hours. (Do not spray animals.)

Exhaustive tests have shown that proper residual applications in dairy barns do not result in milk contamination. DIAZINON is also preferred for control of flies in barns housing other livestock, and for maggot control in manure pits.

DIAZINON is available in wettable powder, emulsifiable solution and granular bait formulations. Ask your farm supply dealer the best method of DIAZINON fly control for your particular problem.

Use ***Geigy METHOXYCHLOR*** *to round out your fly control program*

Direct applications of METHOXYCHLOR to livestock (or use as back-rubbers) are effective in controlling horn flies, lice, and ticks. METHOXYCHLOR is safe to use. It has low toxicity to men and animals and provides long residual action against insects. Available as GEIGY METHOXYCHLOR "25E"—a 25% emulsifiable solution for use in sprays and in cattle back-rubbers, and GEIGY METHOXYCHLOR "50"—a 50% wettable powder and dust base especially useful for direct applications to livestock. Ask your dealer about METHOXYCHLOR when you purchase DIAZINON.

Geigy *ORIGINATORS OF DDT INSECTICIDES*

GEIGY AGRICULTURAL CHEMICALS • *Division of Geigy Chemical Corporation* • **89 Barclay Street • New York 8, N.Y.**

which makes 3 to 10 gallons, depending on the strength desired.

Baits and varnishes:

There are several ways of baiting flies. Mixed with sugar solutions or molasses, fly poisons can be poured out of a sprinkling can to make bait paths in protected areas of barns and outbuildings, or painted on sunny walls. They should not be used within reach of animals or children. It would take several ounces of the pure undiluted baiting chemical to poison a human, but there is no point in making him sick. Flake forms of baits are ready to use and can be sprinkled around the farm buildings in protected areas and on manure. Chemically treated strings can be hung overhead in animal barns. A fly naturally goes for strings as a landing spot. Screen wire bait stations can be placed at strategic points. Baiting poison costs from 50 cents to $1.00 a pound.

Self-treating devices:

Automatic treadle sprayers are a timesaver because the animal sprays himself when he walks through a chute, on the way to and from the water tank or the barn. A fly-killing mist is shot out of one or two nozzles by the action set up when the animal steps on the treadle. The initial cost ($45 and up) and labor involved in setting up this type of control is a drawback. Milking room and barn areas still must be sprayed.

This cow is spraying herself on the automatic treadle sprayer developed by the Illinois Natural History Survey, Urbana, Illinois. When the animal steps on the platform, a spray is released. The spray is usually of the pyrethrin type, which is safe for direct application.

Back rubbers and rubbing posts will be used by cattle if they are located near water tanks, salt licks or shaded areas. A cable is stretched between a post and the ground and covered with wrapped burlap. The cloth is kept soaked with fly-killing chemical. Treadle devices and back rubbers are available commercially, and cost $18 and up for back rubbers. The treadles are more

save building dollars . . .

Bunker Silos cut labor costs 50%

Bunker silos are increasing in popularity . . . and with good reason. They cost less to build than upright silos and they lend themselves to better self-feeding arrangements, thus reducing labor used to handle silage.

It is easy to build a bunker silo that will last for decades if you use Koppers pressure-creosoted poles and lumber, plus a reinforced concrete floor. Unskilled labor can erect the silo. The job is completed quickly . . . the savings in labor amount to about 50 per cent.

Koppers Lumber used for silos is pressure-treated with creosote to make it last. It is thoroughly protected against rot and termites.

Contact your nearest Koppers dealer or send 50¢ for a detailed plan for building a bunker silo. This plan is flexible. You can adapt it according to the length, width and tonnage you have in mind. Koppers Company, Inc., Wood Preserving Division, Pittsburgh 19, Pennsylvania.

Building Plan

Koppers Company, Inc.
1300-F Koppers Building
Pittsburgh 19, Pennsylvania

Enclosed find 50¢ for detailed plan for building a low-cost bunker silo.

Name .....

Road or RFD .....

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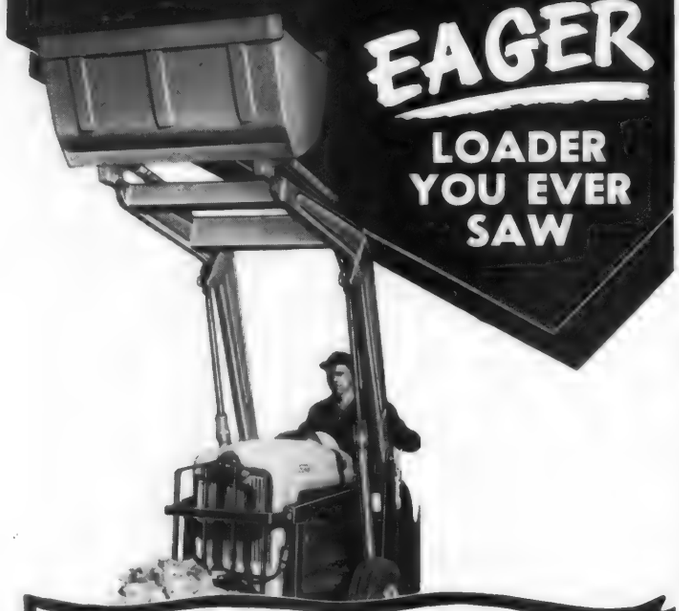
KOPPERS
PRESSURE-TREATED WOOD
POLES • LUMBER • FENCE POSTS

DAVIS . . .

THE MOST EAGER LOADER YOU EVER SAW

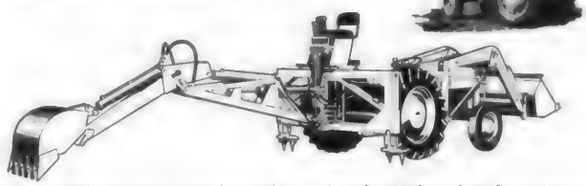


FOR DIGGING, DOZING, DUMPING, LOADING, AND HUNDREDS OF FARM CHORES

The Davis Loader was cut out to do more work, and once you use it, you'll agree. With strength built-in, it has no encumbering braces to mar your vision, or to hamper its work in close quarters. Positive-grip valve lets you handle jobs faster, more efficiently. Many attachments give extra versatility. Quality made, yet reasonably priced. Available for most tractors.

PUSH-OFF SWEEP-RAKE STACKER ATTACHMENT

Tops out 21' stacks and handles a 600-pound bite easily with one-man operation.



New Davis Back-hoe digs at right angles . . . detaches in less than five minutes. Ideal for farm . . . high quality . . . low price.

SOLD AND SERVICED NATIONWIDE BY BETTER DEALERS

Please send me free literature on the Davis Loader_____and the Davis Back-hoe_____to fit a_____tractor.

NAME_____

ADDRESS_____

TOWN_____STATE_____

MID-WESTERN INDUSTRIES, INC.

1009 S. WEST DEPT. F WICHITA, KANSAS

expensive. Spray material for self-treating devices costs about $1.50 a gallon after mixing for use. The amount used will depend on the number of animals in the pasture or lot.

What Shall I Use?

To pick a chemical for fly control may seem almost like picking a word from a dictionary—there are so many of them! If you understand that there are certain basic fly-killing chemicals which are manufactured by the big chemical companies, then sold to local chemical formulators, who in turn mix the chemicals with oils or otherwise dilute them down to a useable strength as a liquid or a flake or powder, you have the picture of this field. In some cases the chemical manufacturer puts the product on the retail market under his own name. Here are the basic chemicals which you will find listed on the labels of most fly-killers:

Chlordane: One of the early chlorine compounds, used as far back as 1945. Sprayed in water emulsion, mixed with petroleum oils, also in dusts. Not used on animals or in dairy buildings. Spray on walls, screens, and surfaces where flies rest. Flies become resistant to this chemical.

Crag Fly Repellent: A solvent for many fly control chemicals, it increases the effectiveness of methoxychlor and pyrethrins and it keeps flies off animals. It is a recently introduced chemical that has shown up well in tests, and on the farm. It will be shown on the label if it is included in a spray. It can be sprayed directly on animals.

DDT: This is the chlorine compound that did a remarkable job of controlling lice during World War II. For several years after the war, it practically eliminated flies where it was used. Then flies became resistant to it and came back in strength. It cannot be used on dairy animals or in dairy buildings. Is used now in rotations of several sprays with other fly chemicals.

Israeli scientists, working to make DDT more effective, have produced a phony DDT, chemically diaryl—(trifluoromethyl)—carbinol. They had hoped it would be an effective substitute for DDT, but it wasn't. To their surprise, when they mixed the phony DDT with the real product, it killed resistant flies much more effectively than either chemical alone. Scientists theorize that the phony DDT saturates the organ which the insects use to neutralize DDT. This allows the original form of DDT to work with full effect.

Diazinon: First tests in this country with this new Swiss-developed phosphate-type chemical compound in 1953 showed it did an outstanding fly killing job. Reporting on his tests, Curtis W. Wingo of the University of Missouri, said: "The University of Missouri beef barn at Columbia was selected as one of the sites for field testing Diazinon because the past spraying history and control difficulties were well known. The barn is approximately 150 feet long and 50 feet wide. It houses beef animals of all ages and types. One wing of the barn opens to the south to feed lots. The roofed portion of this area usually houses 40 to 50 steers on continuous feed programs and is cleaned only once or twice a year. Fly breeding is heavy in this area.

"The beef barn was sprayed on the morning of May 28, 1953, with 25 per cent Diazinon wettable powder at the rate of 32 pounds per 100 gallons of water. This one per cent spray was applied at about 200 pounds pressure and particular attention was paid to spraying vertical resting places such as posts, mangers, entrance ways and windows. The fly population at this time averaged 20 flies per square foot on favored resting places. Kill was complete by 2:00 p. m. on the day of spraying. Five days later an extremely heavy emergence of flies took place in the feed pen area. These flies were all killed within 12 hours by crawling up the treated walls and pen boards of the barn. Excellent control was provided by this spray for 35 days when a gradual build-up of flies became apparent. Migration from adjoining barn areas took place continuously throughout the summer. Practical control was afforded until July 17 (49 days after the spray was applied) when it became necessary to respray the barn. The original spray residue was still killing some flies but emergence and invasion kept the populations too high. The second spray (1 per cent Diazinon) was applied July 17, 1953. This

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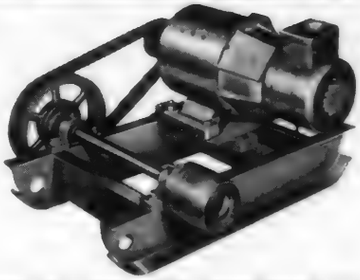

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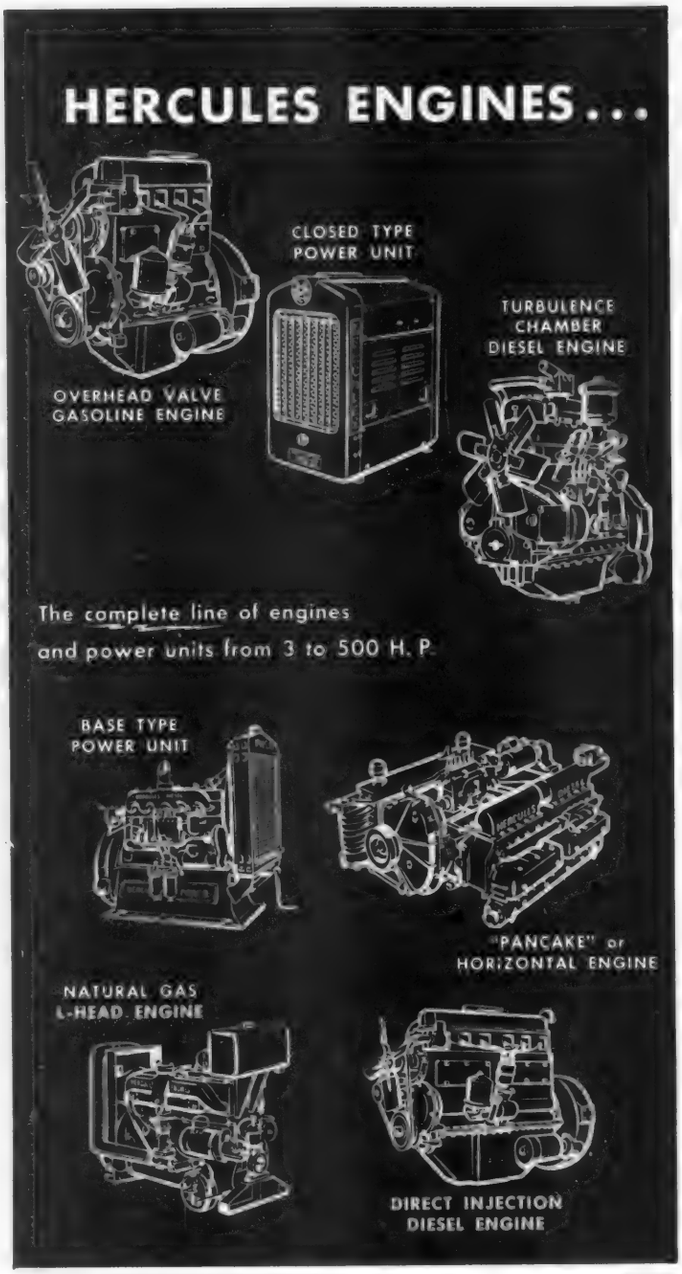
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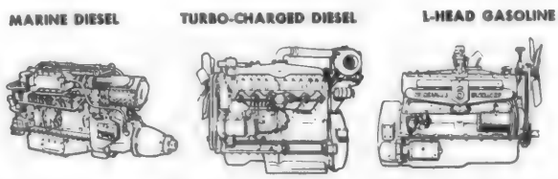

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application gave good control of flies for 47 days or until September 3 when fly populations became excessive. The barn was not sprayed again during the 1953 season.

"Flies were trapped in the vicinity of this sprayed barn at intervals throughout the summer and exposed to freshly treated glass plates (180 mg. Diazinon/sq. foot) to see if continuous field exposure to the insecticide was causing resistance to appear in the population. Flies trapped in the barn throughout the summer, and in September after spraying operations were suspended, were as readily killed by Diazinon as were those flies of the initial population. No build-up of resistance was evident in the population after 97 days' exposure to Diazinon.

"In observing and recording the rise and fall of house fly populations during the test period, it was noted that a substantial kill of stable flies occurred during an 18-day period following the application of the Diazinon sprays. Engorged stable flies leaving the cattle as the animals entered the barn were killed as they rested on sprayed surfaces around the entrance ways. Stable fly populations on the cattle using this barn were substantially reduced during the 18-day period.

"Very late in the season a series of cool nights and warm days concentrated a heavy population of house flies in a long open-front beef cattle feeding shed on the campus of the University of Missouri. During the warm parts of the day these flies flooded into adjoining dairy and physiology barns in great numbers. Steers being fed in the shed averaged over 600 flies per head on September 19. A 1 per cent Diazinon spray was applied to all walls, pens and gates in this shed on September 19. Cattle and hogs in the pens were simply herded to the far end of the enclosures while spraying was under way. On September 21, house fly populations averaged less than 2 flies per steer in this area. Excellent control continued until late in October when cold weather halted fly activity."

At Cornell University Agricultural Experiment Station in Ithaca, New York, Professor H. H. Schwardt gave this word to county agents and custom spray operators in November, 1955: "Three seasons of testing in the Ithaca area show that Diazinon will keep flies under control for at least 6 to 8 weeks in a well-kept barn. Use 8 pounds of 25 per cent Diazinon wettable powder in 25 gallons of water, or 32 pounds in 100 gallons. Cover walls and ceilings to the point of run-off, which means approximately 1 gallon on 250 square feet of wall or ceiling area.

"Diazinon is more toxic than DDT and should be handled with caution. During the spraying operation all animals should be taken out of the barn and kept out for four hours thereafter. Do not spray directly into mangers or fountains. There should be no hay, silage, feed or salt left exposed to the spray. Dairymen or others making occasional applications of Diazinon in their own barns need not wear raincoats or respirators, but custom operators using the material daily for several days or weeks should wear raincoats and respirators for protection."

J. C. Keller of the USDA Entomology Research Branch at Orlando, Florida, tells of an 80-stanchion dairy barn which was sprayed with Diazinon. The original cost of chemical material made it expensive, about $25. However, considering the 421-day fly control the spray gave, the per day cost would not be out of line.

Diazinon is available in a shaker top cannister in a granular form and can be obtained in a liquid 25 per cent emulsion concentrate for making residual cover sprays, spot sprays and baits. It should never be used on animals.

Dipterex: A phosphorus compound. It is also known as "Bayer L13/59." A recently introduced fly control chemical, it has especially good knock-down qualities when used as a dry bait, a varnish, or as a liquid bait. It is effective against all strains of flies, resistant and non-resistant. One important advantage of Dipterex is quick solubility in water, which makes it extremely easy to turn it into a wet bait that can be used in a sprinkling can. It should not be used on walls or surfaces that animals can lick. It should never be used on animals. Its residual effect will kill flies for several weeks.

Lindane: A purified form of benzene hexachloride. The chemist calls it the "pure gamma isomer of benzene hexachloride." It is manufactured in wettable powders and emulsions. While flies do develop resistance to it, it is considered a versatile fly control chemical. It is often used in sprayed white water-type barn paints and it has a good residual effect. It can be used on walls of dairy barns and other farm buildings but should not be used on animals.

Malathion: An organic phosphorus compound that has been used with excellent results for the past several summers as a granular dry bait and a wet bait. It can also be used as a spray inside dairy barns and other farm buildings. It should not be sprayed on animals.

On July 7, 1954, Dr. Elton Hansens of Rutgers University stopped in to see Charles K. Hires, Jr., who owns and operates Hiresdale Dairy near Salem, New Jersey. His proposition was that the dairy barn be sprayed thoroughly with malathion, and the Entomology Dept. make periodic counts of fly populations. The big question that Dr. Hansens wanted to answer was: "For how many days after spraying would malathion continue to give satisfactory fly kills."

The barn was sprayed in late July and, in Mr. Hires' words: "We had an excellent control of flies for at least six weeks and fair control for two more. By that time the fly season was over so the barn was never re-treated." Mr. Hires was very enthusiastic with the results. "Flies dropped off immediately after the spraying," he said. "They became so scarce around

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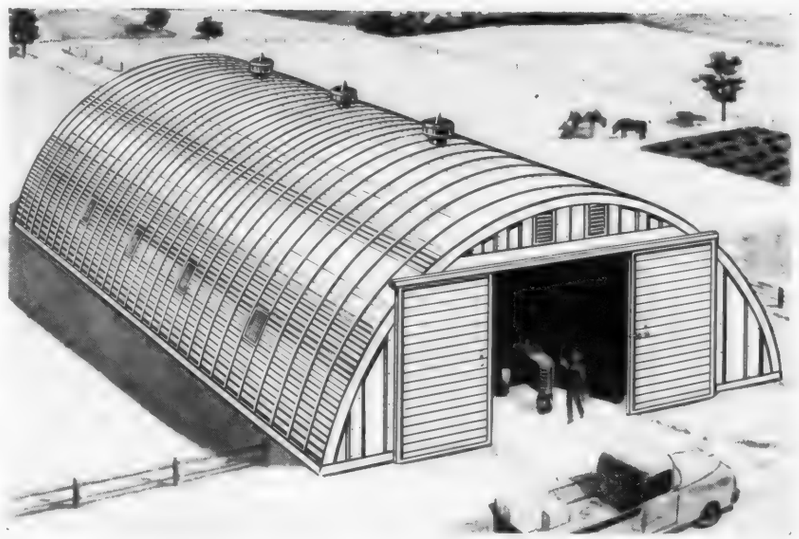

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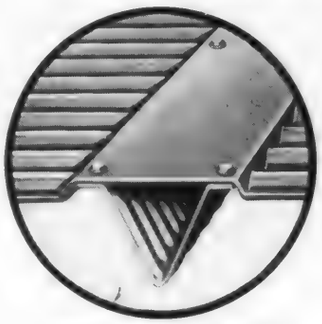

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the milk plant that we stopped using the fogging machine and haven't used it since." The spray contained 2 gallons of 57 per cent emulsifiable malathion and 20 lbs. of sugar in 100 gallons of water and all interior surfaces were treated to the run-off point.

This past summer (1955) the interior barn surfaces were again sprayed with the same concentration of malathion plus sugar in late June. This was a hotter, damper summer—more favorable for rapid fly breeding than 1954. About four weeks after the treatment, fly populations were beginning to build up again. Instead of respraying, however, malathion liquid baits were applied to the floor areas. A mixture of two ounces of 57 per cent malathion emulsion plus 1½ pounds of sugar in 2½ gallons of water was sprinkled from a sprinkling can once a week. These weekly bait treatments continued to hold fly numbers at a low level for the rest of the summer.

Methoxychlor: This is a safe member of the chlorinated compounds; this one usually comes in a wettable powder containing 50 per cent methoxychlor. It can be used on animals and in the dairy barn. House flies have become partially resistant to it in some areas. It is usually used in connection with a whitewash-type barn paint, such as Borden's Sano-white, in a 2½ per cent solution. With 100 gallons of water (weight 800 pounds) you'll need 20 pounds of methoxychlor. Since it is available as a 50 per cent powder, often under a brand name (DuPont calls it "Marlate"), you'll need 40 pounds of the powder to make a 2½ per cent solution.

The USDA has found that a quick and easy way to control horn flies is to put a tablespoonful of methoxychlor powder in your hand, then sprinkle it along an animal's back, neck and sides. Spread it around evenly and work it into the hair. This will give two or three weeks' control of horn flies which have not developed a resistance to it.

Philip Granett and Elton Hansens of Rutgers University experimented with two herds of cows that were bothered with horn flies. Each of the two herds located in Salem County, New Jersey, were divided into three groups almost equally susceptible to biting fly attack and providing similar milk production. Two of the groups in each herd were sprayed at weekly intervals with two water emulsion formulations. One of the formulations contained ½ per cent methoxychlor (1 quart per animal) as the active ingredient and the other contained methoxychlor plus butoxypolypropylene glycol (Crag fly repellent). The third group was left as an untreated check. Daily observations were made of the number of biting flies on the individual cows and the milk produced. For a period of five to seven weeks, it was found that a significant drop in fly num-

bers (horn, stable, and horse flies) was observed on the treated groups one to two days after spraying applications. An increase in milk production of about a 2½ pound average per cow was found on one farm for one day following the use of the methoxychlor formulation and for two days following the use of methoxychlor plus butoxypolypropylene glycol. The increase in milk production more than paid for the cost of fly protection.

Parathion: An organic phosphorus compound, originated by Bayer in Germany. It is used for baits and residual applications, and should not be sprayed in dairy barns or on animals. A brand-new method of fly control that has been tested for several years by the U. S. Public Health Center at Savannah, Georgia, is a cotton cord impregnated with parathion. The cord makes a good landing place for flies and they are killed almost immediately by the poison. The cord is strung across the interior of any outbuilding where flies congregate. A few drop cords are left high enough so they will not be within any animal's reach. In tests, dairies and chicken farms with a fly count as high as 300 houseflies per square yard, had their population reduced to 1 or 2 flies per square yard over an 8 months' period. At the present time, one product that is prepared for barn use is available on the market. It is called "Fly-Cord" and it comes ready to use as a bright red cord.

Pyrethrin: An organic extract originally made from a chrysanthemum flower. Now much of it is a synthetic product. It is

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A new method of push button barn fogging has been worked out which uses permanently-installed plastic half-gallon bottles hung on the barn ceiling. These bottles are filled with insecticide and are connected to a central air compressor with a rubber hose. To fog an entire barn all the farmer has to do is to switch on the compressor, called the "Fog Master." The units are made by Thomas Industries, Sheboygan, Wisconsin.

Organic thiocyanates: These products were the first of the synthetic organic insecticides and have been on the market for about 25 years. Originally they were used as the sole toxic ingredient in oil-based cattle sprays and household sprays. Today they are used as the knock-down agent in oil-based sprays and are combined with methoxychlor or other ingredients to provide oil-based sprays that are safe to use and highly effective in knock-down and kill. They can be used on dairy animals and in household applications. They have also found an important place as a knock-down ingredient in the aerosol bombs which have become popular for fly control. Organic thiocyanates are sold under the names of Lethane and Thanite but are described chemically on fly spray labels as beta butoxy beta' thiocyano diethyl ether or isobornyl thiocyanoacetate.

How Safe is "Safe"?

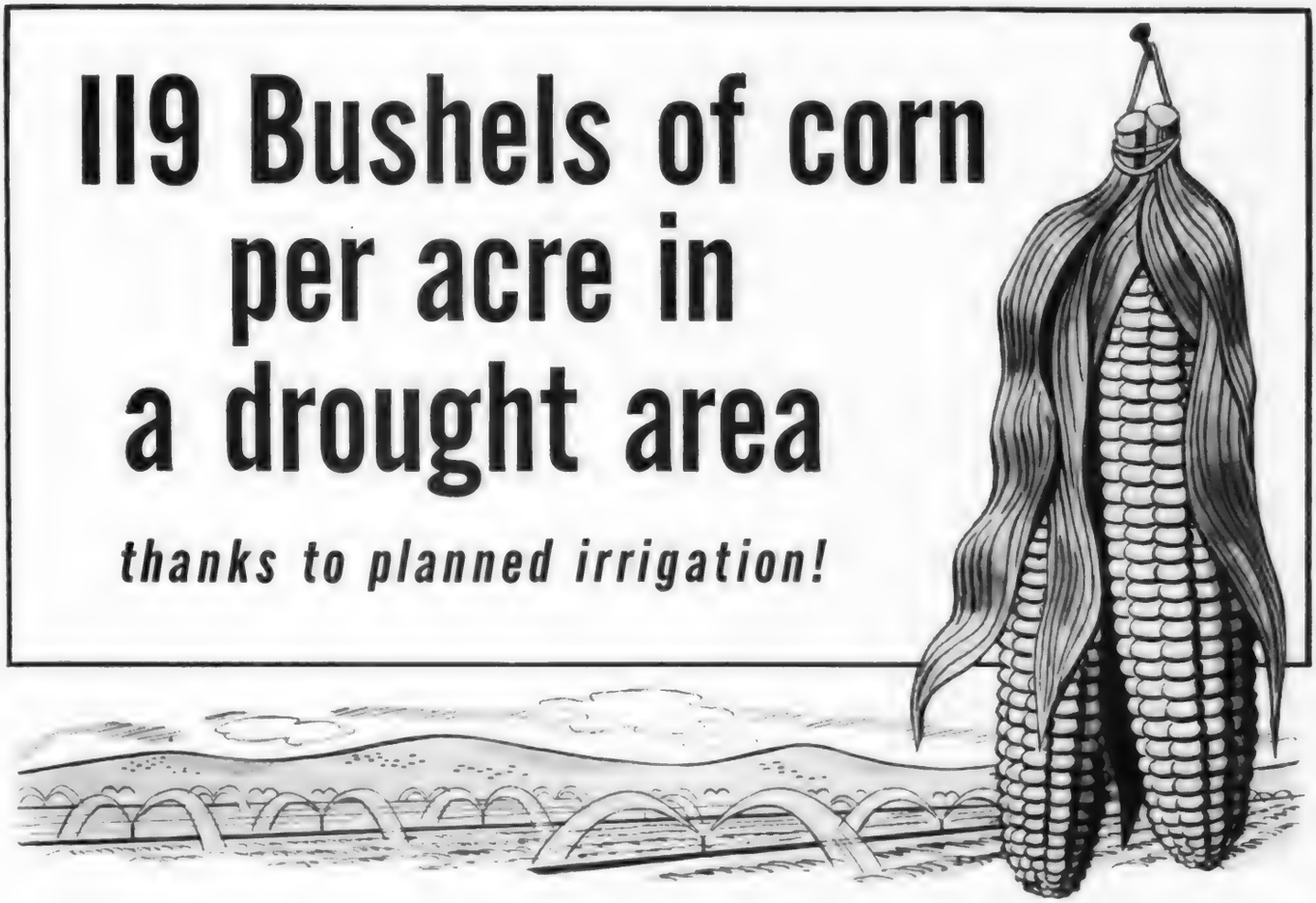
Iodine is poison if used internally; aspirin is, too, in abnormally large doses, yet not many American farms would be without the benefits of these useful products. Insect killing chemicals require care in their use, too. In a review of 20,000 farm accidents, presented by Dr. Lemuel C. McGee at the Eighth Annual Gulf Coast Industrial Health Conference in the fall of 1955, it was reported that "striking or bumping against objects," "lifting and handling objects," and "falls" topped the list as being responsible for approximately 45 per cent of the farm accidents. The misuse of farm chemicals was twelfth on the list, causing 1.74 per cent of the accidents. So we have little reason to be scared out of using chemical aids to farming. But that doesn't mean we can be careless when we use them.

An attitude of "it can't happen to me;" "I'll take a chance on this being a short cut," or "I don't have time to read the directions," can cause damage to crops, farm animals, and people. Insects are tough. After the atom bombs were exploded, everything but bugs were wiped out. Man's "100% LD" (lethal dose) of atomic radiation is about 600 Roentgens exposure. A fly can take 3500 Roentgens and a mosquito 8000. We have to use powerful insecticides to beat down the insect enemies. It is important that farmers who use them know what they are doing. Every package is labeled and instructions should be followed closely. Handle insecticides with caution. Avoid prolonged exposure of skin to insecticides. Avoid breathing large amounts of mist or dust. Do not spray oil solution near an open flame. Don't contaminate feed, feed troughs, drinking fountains by spraying or dusting near them.

It is a big battle and a worthwhile one. Dr. George S. Decker, Illinois Natural History Survey entomologist, estimates that we annually permit pests—insects, plant disease, weeds, rodents—to wipe out the work of 25 per cent of our agricultural labor force. Fly control is a field where we know how to cut the loss.

119 Bushels of corn per acre in a drought area

thanks to planned irrigation!



WAYNE DARLING of Shelby County, Iowa, got a corn yield of 119 bushels per acre during last year's extreme heat and dryness—according to a yield check made by an instructor in vocational agriculture.

The reason was planned irrigation—using a system made with Kaiser Aluminum pipe supplied by Evans Orchard Supply Co. of Kansas City. Darling irrigated his 70 acres of corn with 10 inches of water during the dry period—6 inches in July and 4 inches in August.

Marvin Darling, a cousin, whose farm is 7 miles away, also reports "a wonderful crop of corn on the bottom"—because of irrigation.

The Darlings say that this one season's irrigation paid for their systems—and they plan to enlarge them immediately.

In Ray County, Missouri, Hubert Wheeler, irrigated 100 acres of corn in 1955 and harvested 116 bushels per acre. He watered once prior to planting and applied 4½ inches of water at tasseling time. Wheeler—whose system uses Kaiser Aluminum pipe, supplied by Evans, says, "I also used my equipment to irrigate soy beans and alfalfa. I got good results from this, too—made 30 bushels of soy beans per acre and got 5 cuttings of alfalfa."

Why you should ask for Kaiser Aluminum pipe in your irrigation system:

Kaiser Aluminum Welded-Clad Irrigation pipe gives you the greatest advantages of any irrigation pipe—at no extra cost!

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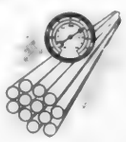

Greatest Bursting Strength. Hydrostatically tested with pressures up to 700 p.s.i.* Insures maximum resistance to surge pressures.

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*All figures for 4 inch/30 foot pipe.

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Kaiser Aluminum

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Farm Irrigation Service, Room 6661
1924 Broadway, Oakland 12, Calif.

Please see that I am provided with engineering assistance for setting up my irrigation system with Kaiser Aluminum Welded-Clad pipe.

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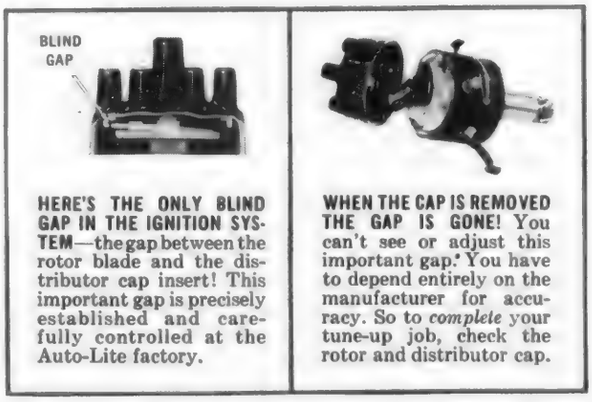

HERE'S THE ONLY BLIND GAP IN THE IGNITION SYSTEM—the gap between the rotor blade and the distributor cap insert! This important gap is precisely established and carefully controlled at the Auto-Lite factory.

WHEN THE CAP IS REMOVED THE GAP IS GONE! You can't see or adjust this important gap. You have to depend entirely on the manufacturer for accuracy. So to *complete* your tune-up job, check the rotor and distributor cap.

AUTO-LITE Original Service Parts

ORIGINAL AUTO-LITE SERVICE PARTS

Auto-Lite manufactures over 400 products, including Spark Plugs, Batteries, Wire and Cable and Automotive Electrical Systems . . . sold throughout the United States and Canada.

OASIS FARMER

(*Continued from page* 36)

pens to find a crop worth harvesting. The grain and the straw are brought back to the oasis. The straw is for the camel when the grass runs out. Except for what he can browse, the camel's ration is almost exclusively straw. Perhaps this accounts for the universal bad manners of the camel. A more cantankerous, ornery, evil-minded beast does not exist. Beside him the American mule is a lovely, sweet-tempered angel. The camel, on the other hand, thinks a good deal of himself, and lets you know it. There is no animal that can give one a stronger sense of inferiority than this beast who regards man as disdainfully as a Boston dowager might view an ineligible suitor for her daughter's hand.

The camel usually wears a muzzle—there is no adult Arab who can not show several hunks missing out of his anatomy, chewed out by his camel in an unguarded moment. Give a camel half a chance and he will spit on you, blow his nose in your face, kick, bite, and fall on you, or wedge you against a wall and stomp on your feet.

But the Arab couldn't do without him. He can keep up his steady, awkward walk for a week (with little feed and no water at all); he can carry great loads—contrary to legend there is no straw that can break a camel's back; when he is overloaded he simply refuses to move.

When he hasn't straw, he will eat cactus, and when he hasn't any cactus he will get along pretty well on scrap lumber—or anything at all. Good cheese is made from camel milk.. His hair provides cloth, his hide, leather for sandals and waterskins and harness, and when he gets too old to work his master eats him. He's the most unbeautiful animal there is, running to humps, bumps, and unexpected angles; and he stinks; and has fleas; but Allah be praised for the camel.

Khalifa has a herd of thirty-five or forty sheep and goats. In numbers they are about half and half, although Khalifa makes no distinction. He shears both once a year. From the goats a coarse cloth is made, used chiefly for tents; the sheep yield a coarse wool, used mostly for carpets. The sheep are of the broad-tailed Asiatic breed and are able to do without feed and water almost as long as a camel, drawing on the nourishment stored up in their broad, fat tails. Khalifa milks his sheep and goats. Cheese is made from the milk. When a sheep or a goat no longer yields wool or young, Khalifa skins it, sells the skin, and feasts on the carcass. At a wedding, or perhaps a circumcision feast, he indulges his family and guests with a lamb. There are no pigs in the Moslem world—pork and pork products are forbidden by Koranic law. Dogs are regarded as unclean also, but Khalifa has one to guard his sheep from marauding jackals. He has a number of fine cats and a half-grown gazelle which one of his sons captured on a desert trip.

Domestic and Personal

Khalifa has one wife. As a Moslem he could have as many as four, but a wife costs a good round sum in cash and Khalifa is not a rich man. Formerly the price of a wife was reckoned in cows or camels or sheep. But the modern custom is for a father of a marriageable daughter to demand cash. The price—based on supply and demand—is whatever you can get. The younger and prettier the girl, the higher the price. The most Khalifa saw of his wife before he married her was a dim view of her left eye, at a distance. He had to take the word of the women in his family that she was young and beautiful, and in the Arab world, as in the Western world, no bride was ever other than young and beautiful. So Khalifa was getting a pig in a poke; he knew it and didn't care. Love of a youth for a maid as a necessary ingredient of a happy marriage is unknown in Khalifa's world—a wife is little more than a handy appliance for a household.

While the father of the bride receives a cash price for her, she takes with her a dowry in the form of gold and silver ornaments, jewelry, gems, and bric-a-brac. The nomad habitually counts his wealth, not in money, but in silver and gold ornaments, objects of

art, and jewelry. This wealth, and it may be considerable, adorns his own person, his horse, or his women. This goes to marriageable daughters as dowry. Arab women marry young. At a wedding, the child bride sits alone and unnoticed through the week-long ceremony, weighted down with expensive hardware, while the menfolk dance and sing, race their camels and horses, shoot off their guns and mouths, and stuff themselves with palm juice and kus kus, the national stew.

Khalifa has few recreations aside from an occasional dance (men only), races at a wedding, and the joy of eating on feast days. He has never been to a movie, but he has seen television. The United States Information Service has installed a television set on a platform on one of the main crossroads into the city of Tripoli. Khalifa made the long trip to see a program in Arabic and plans to return.

Let's Spend the Egg Money

Khalifa's world is a man's world; there is some doubt about whether a female may inherit the kingdom of heaven. There are houris in the Moslem Paradise, but they are permanent residents. The Moslem keeps his women in the closest seclusion—in public she may show only one eye, and she takes no part in the social life of her husband. It is doubtful that any man, except her husband and members of her own family, has ever seen the face of Khalifa's wife.

However, custom has given her a few restricted rights. One of them is that she gets the egg money—not all of it, but some. Khalifa is generous—he allows her to sell two hens each year, and she also gets half of the eggs that are sold. This allowance she can spend as she wishes—a length of cloth for a dress, an ornament, or a whiff of perfume. She does not complain.

The Institution of Kus Kus

Kus kus to the Arab is what caviar and champagne are to the Western world. The poor Arab will tell you that the rich have kus kus every day, but that he can afford it only when there is a wedding, or on rare occasions during the holy month of Ramadan (the ninth month). Kus kus, like motor cars, comes in both popular and deluxe models. The kus kus of the desert Arab is cereal and meal rolled into small pellets and cooked over steam. Chicken or mutton is stewed with tomato sauce and olive oil and fil-fil (very hot Chile peppers) and the resultant sauce is poured over the cooked cereal. Hard-boiled eggs, chick peas, squash, boiled potatoes, and the meat are placed on the top. It's hot enough to blow the top right off your head and curl your hair permanently. You can substitute camel for the lamb, and if you are rich, you can add rare and exotic herbs, condiments, and viands. A Westernized variation with a minimum of hot peppers is delicious.

The Law and Khalifa

Just as Khalifa's religion casts its shadow over his farming, so do his tribal obligations and rights shade into and somewhat confuse his rights and obligations under civil law. Not so long ago he was completely a tribesman, and his sheik was his ruler. A succession

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of masters, Turkish, Egyptian, Italian, through the centuries interfered little with the Arab in his desert oasis and today civil government lays only a light hand on him. His sheik, which is pronounced to rhyme with "shake" and means "wise old man," is the highest power in his everyday life. To him he goes with his problems and his disputes. When American give-away wheat is distributed, Khalifa will find his portion in the house of the sheik. Should there be a water-right dispute, the sheik will arbitrate in the Moslem court, and if a foreign technician recommends that Khalifa spray his trees, Khalifa's sheik will tell him whether or not it should be done. The titles and rights to lands and water and palm trees, while not actually recorded, are nevertheless secure in the Moslem courts. It is the sheik's duty to know every goat, every tree, every camel, belonging to his tribe. Only an old man could do this.

In modern times the Turks attempted to bring some lucrative order out of the chaos of tribal rule, and imposed a system of taxes. The inability to determine legally the ownership of lands made a real estate tax out of the question. The main tax paid by the Libyans is the Biblical tithe on his cereal harvest, paid in kind. The present government has extended taxes to cover livestock and fruit trees. Khalifa will pay 2 to 3 piasters (piaster is 2.8 cents American) each on his olive trees, a piaster on a fig tree, 5½ piasters on each sheep, and 3½ piasters on each goat. Only animals that produce a saleable product are taxed. Camels, for example are not taxed. In the far reaches of the desert the only tax imposed is a poll tax, sometimes difficult to collect.

At Home With Khalifa

Khalifa's home is simplicity itself and inexpensive to build and maintain. A form is built for the walls and adobe-like clay is tramped into the form. The flat roof is also made of mud, packed over wood supports. These supports are usually limbs from dead trees and may have to be bought, an expensive item. There are no doors or window sills, and the floors are hard packed clay. Coarse woven drapes of goat hair serve as doors and windows. The walls are whitewashed inside and out.

The only furniture is a rude chest in which Khalifa's wife keeps the few extra clothes of the family, her ornaments, and her pretties. One of the rooms is almost completely filled with a loom on which she weaves the barracans for the family and the coarse tent cloth. Reed or palm frond mats on the floor serve as beds and chairs, and, of course, Khalifa has his mattress. The house is never locked, and no man is ever turned away hungry. Khalifa's hospitality is unbounded.

He has no stove. Water is heated and the porridge is cooked over a twig fire on the floor, or over charcoal. His charcoal burner is an old tin bucket with holes punched in the bottom. A chipped enamel teapot, an iron cooking pot, a half dozen two-ounce tea glasses, are his kitchen utensils. A 10-gallon German army gasoline can is used for water storage.

He has no clock, no electric lights, no radio, no geranium on the window sill nor fresco on the wall. An old Roman lamp, rarely used, provides the only light when he needs light, which is rarely, for he goes to bed at sunset. His home is purely utilitarian —a place to sleep, a place of refuge from the ghibli, those dreaded blasts of sand and heat which sweep over the desert; and a shelter when the rare rains come. He will often pitch a tent against the wall of his house and live there, using his house for the livestock and grain storage.

Khalifa has no plumbing, inside or out, and neglect of the simplest rules of sanitation results in chronic intestinal disorders. Infant mortality is very high, mainly due to the practice of weaning the baby directly from the breast to a diet of partly cooked porridge. In the hottest months when the baby is being breast fed the mother believes it should have no water to drink. This leads to acute dehydration from which many babies die. There are many forms of intestinal bacteria to which the native is immune, but these bugs have no respect at all for the foreigner, infecting him with what is quaintly called The Tripoli Trots. The unfortunate affliction was blamed on the Egyptians by the

(*Continued on page* 118)

A group of our pure bred Charolaise cows on pasture.

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Because of their rapid growth characteristics. percentage of yield, and prepotency of bulls, the Charolaise will definitely have a tremendous influence on our future beef industry. The spread of Charolaise in this country has been slow. due to the fact that so few full-blooded animals were imported into this country. This, and the impossibility of importing any from France means that there are relatively few pure bred Charolaise in the United States.

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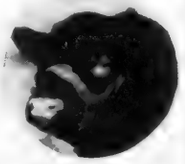

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FARM BOOKS

(*Continued from page* 24)

Beginners at the business will likely memorize much of the material Sechrist sets forth on opening and inspecting the hive, inspecting the brood nest, finding the queen and the general care of the colony. In fact, he recommends that they have all the facts well in mind before starting to work lest they panic at the wrong moment and are forced to beat a hasty and disorganized retreat during their first efforts at management. But others, whose interest in bees may never pass the academic stage, will find these sections equally

(*Continued on page* 152)

FARM BOOKS RECOMMENDED BY THE EDITORS

Livestock

Feeds and Feeding (21st ed.)—by F. B. Morrison **$7.00**
The authoritative book on livestock and poultry feeding.

Beef Cattle—by Roscoe R. Snapp **$6.50**
A carefully revised edition of this excellent book on beef production.

Dairy Science (2nd ed.)—by W. E. Petersen **$6.50**
A new edition of one of the best books on dairying.

Dairy Cattle Breeding—by L. O. Gilmore **$6.50**
The problem of dairy cattle genetics written for the farmer.

The Livestock Book—by W. R. Thompson et al. **$3.50**
This is the sequel to the best selling "Pasture Book." It's a good one.

A Veterinary Handbook for Cattlemen—by J. W. Bailey **$5.00**
For that emergency when you can't reach the veterinarian.

A Veterinary Handbook for Swinemen—by J. W. Bailey **$5.00**
A companion volume for the hog raiser.

The Hog Annual—by the editors of Farm Quarterly **$4.25**
Complete articles on hog raising and lists of breeders.

Successful Poultry Management—by M. A. Jull **$5.75**
The second edition of this practical book on poultry.

Breeding Better Livestock — by Rice, Andrews & Warwick **$6.50**
Understandable breeding plan for the livestock man.

Farm Management

Planning Farm Buildings—by J. C. Wooley **$7.00**
Your buildings and barn lot can save you steps.

Farm Work Simplification—by Vaughn & Hardin **$2.96**
Make your farm work easier and faster.

A Practical Guide for the Beginning Farmer—by Herbert Jacobs **$3.00**
A book to give you an intelligent start in farming.

The Farmer's Handbook—by John M. White **$4.95**
Easy reference book on crops, livestock, and farm problems.

Handbook of Agricultural Chemicals—by L. W. Hanna **$3.25**
The chemicals, directions for use, and precautions in using.

Soil & Crops

Farm Soils—by Worthen & Aldrich **$4.96**
A non-technical book on soil for the working farmer.

Soils and Fertilizers—by Firman E. Bear **$6.00**
An understandable book on the complex subject of fertility.

Irrigated Soils—by Thorne and Peterson **$6.50**
The practice of irrigation and the management of irrigated soils.

The Range and Pasture Book—by Donahue, Evans and Jones **$5.60**
Beautifully illustrated, easy to read.

Soybeans—by Floyd W. Barnhart **$3.75**
From planting to marketing.

You Can Grow More Corn—by Dungan, Lang & Lowery **$3.50**
Higher corn yields without cost increases.

Grasses & Grassland Farming—by H. W. Staten **$5.00**
Covers grasses in all parts of U. S.

The Pasture Book—by W. R. Thompson **$3.50**
Revised edition of this information-packed book.

Miscellaneous

Amateur Beekeeping — by Edward L. Sechrist **$3.50**
The basic book for the beginner in bees.

From My Experience—by Louis Bromfield **$4.00**
Shortly before his death Bromfield summed up his Malabar experiences in this book.

Colorstrip Plant Testkit **$4.00**
Tells whether your crops are getting enough nitrogen, potassium and phosphorus. Complete instructions come with the kit.

The Farm and Ranch Record Book **$3.85**
Loose-leaf farm record-keeping book. Ideal for income tax purposes. Refill sheets available.

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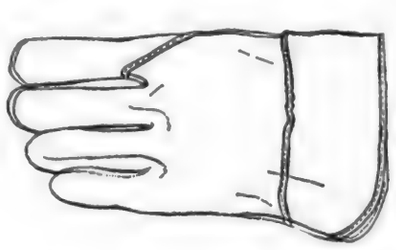

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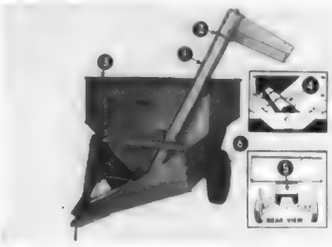

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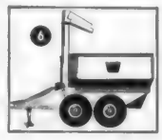

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4. Tailgate is spring loaded—grain-tight and easy opening—no catches or bolts to freeze. Delivery height over bunk adjustable.
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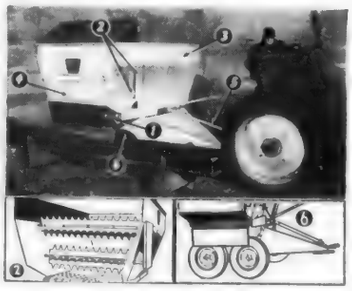
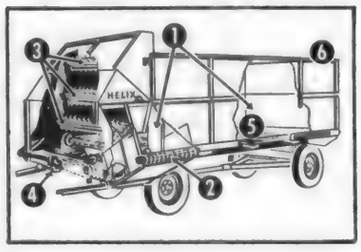
6. Tandem axles optional, extra; single axle on 15" drop center wheels standard.



HELIX CROSS-CONVEYOR UNLOADERS



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4. PTO drive through gear box transmission; 20 different unloading speeds—2½ to 22 minutes for full load.
5. 2-section all-steel conveyor belt full width of box—can't clog or pack.
6. All-steel welded construction.

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1. Capacity: 160 bu., 7 x 14 ft. size; 125 bu., 6½ x 12 ft. size with standard 24" sides. Capacities doubled with 48" sides (320 and 250 bu.).
2. 2-section all-steel conveyor belt full width of box—can't clog or pack.
3. PTO drive through gear box transmission. Optional variable speed control gives 20 different unloading speeds.
4. Tailgate is spring loaded—grain-tight and easy opening—no catches or bolts to freeze.
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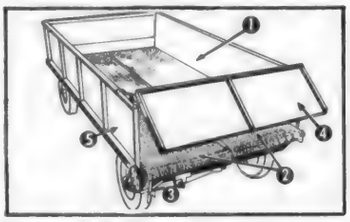

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OASIS FARMER

(*Continued from page* 114)

British, who called it "Gippy tummy." Trachoma, too, is endemic and almost every adult Libyan has had one or two or more attacks.

The problem of sanitation is aggravated by the scarcity of water. The Koran prescribes cleansing five parts of the body before prayer—both hands, both feet, and the genitals—and prayer is five times a day. That would require more water than is ordinarily available. So in course of time the Arab has developed a dry-cleaning process for his body—made-do with sand—and an excellent cleansing agent it is. The fine, gritty desert sand is a good abrasive, and while it is not as pleasant to use as soap and good warm water, it gets right down to the pores and takes off the dirt and as much skin as the bather has fortitude.

Khalifa's Learning

Khalifa can not read nor write, but he is able to laboriously inscribe the Arabic symbols for his name. He attended a Koranic school for a short time when he was a boy, but his father took him away to herd the sheep one fall and he never resumed. He is sending his younger children to a Koranic school at the mosque in the oasis and would like for them to continue in one of the secondary schools now being established. When the new Libyan kingdom was established in 1951 a clause in the constitution hopefully stated that education should be universal and compulsory. This ambitious program is handicapped by a shortage of teachers. Teaching was for generations left to the religious schools connected with the mosques. Lay schools were manned by Italian teachers, and recently by Egyptians, thinly disguised propagandists sponsored by the Egyptian government. There are few native teachers since, until recently, there

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were no training colleges. Traditionally, only boys attend schools; females, having no use for learning, remain illiterate. Recently, in some of the towns, the educational door has been opened a crack to admit girls, and many Libyan women have enrolled in the training schools.

Khalifa's Wardrobe

Khalifa wears a barracan, a garment admirably adapted in every way for the Arab and his way of life. The barracan descended from the Roman toga. Khalifa's barracan is a strip of wool cloth, woven by his women on a loom in his hut. Its size is indeterminate, depending on the size of the wearer. Any attempt to find out its exact size sets off an argument similar to those which Americans engage in when the question comes up about what a Scotsman wears under his kilt. For big men, the length may be as much as twelve feet, the width four feet. It is wound around the body and over the head. It protects against the heat of summer and the cold of winter, the rain and the blowing sand. At night it serves as a blanket. Men wear white barracans, but the women go to color and bright patterns.

Child of God

Khalifa is a child of God. He has not been confused by dogma or theology; his faith is simple, direct and personal. He needs no intermediary between him and his God, no chapel or cathedral, but builds his own wherever he is when the hour of prayer comes. He dismounts from his camel and makes a ring of pebbles on the sand. This is his mosque. He kneels toward Mecca, and praises his creator. He asks few selfish boons, but places himself in Allah's hands—"Thy will be done." He is not a seventh day worshipper—God is with him every hour, and his planting, his eating and his drinking, his every act is prescribed by the Koran, much of which he can repeat from memory.

He prays five times each day. On a journey, should he come upon the tomb of a Marabout, a saintly man, he will stop at this holy place and pray.

As God walks at one elbow, death walks at the other. Centuries of life on the desert have toughened the Arab and made him a man of fortitude and courage. A journey into the desert, at any time, is a journey with death always close by. Death can claim him from thirst, hunger, and storms, hostile tribesmen, or injury to his camel. At any time these may offer him a hasty tomb under the restless sands.

Khalifa spends a good deal of time just sitting. In the afternoon he may visit a friend and there will be endless conversations on how rightly to interpret a passage from the Koran or how to correctly gauge what should be left to Allah and what one should do himself. His farming and livestock operation, like every move of his everyday life, is so tied up with his religion, his tribal taboos and customs and his predilection for leaving almost everything to God, that moving him to take up new ways and new methods is not unlike asking the mountain to come to the Prophet. I. C. A. (Point Four) F. A. O., L. A. R. C., and all the alphabet soup of international committees and cooperative agencies have found that out.

But Khalifa is polite and listens and says but certainly he would like to see two blades of grass grow where one grew before. He'll accept the seeds and the trees and the new breed of sheep. But he just as likely will take the seed and pay off a debt instead of planting it, or if he plants he may leave too much to Allah. He may even plant the tree in the tin container it was shipped in, as one of his neighbors did. Farmers everywhere are conservative, but Khalifa and his countrymen are the reactionary champs of the whole world. But the West perseveres, and slowly the Arab will gain a better standard of living.

A Bit of History

After a spotted history of foreign rule — Phoenician, Roman, Egyptian, Turkish, Italian—Libya became the newest kingdom in 1951 under the auspices of the United Nations. It is experiencing the usual growing pains of a new nation. The United States which once warred with Tripoli, the Tripoli of the U. S.

Here are two examples that show how you can get

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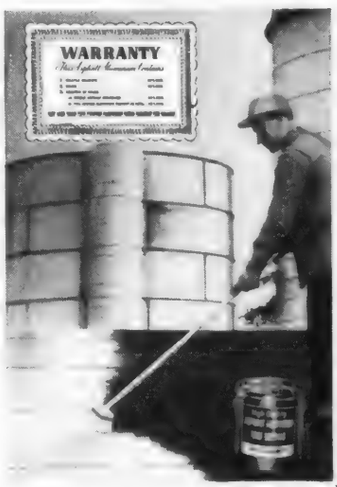
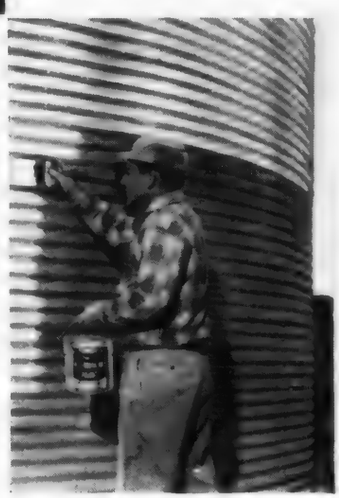


Asphalt-aluminum roof paints and coatings extend the life of built-up and rustable metal roofs. Moisture is sealed out with a coat of metallic aluminum so rusting and deterioration are retarded. Asphalt-aluminum roof paints and coatings also safeguard livestock and help them maintain production because building interiors and shelters are up to 15° cooler in summer. To be sure you get a quality brand, look for the Warranty Seal on the can. It's your assurance of an approved asphalt vehicle containing at least two pounds of metallic aluminum pigment in every gallon.



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Marine Corps anthem, became vitally interested in its welfare when the Base Rights Agreement to one of the largest of our North Africa air bases, Wheelus Field, was signed in 1954.

Although the population is less than a million and a half, Libya's bulk dominates the eastern Mediterranean and the jets with blank H bomb war heads at Wheelus Field point straight toward the Russian heartland. With Wheelus Field a going concern, pressures began to develop. Libya was caught up in the intrigue now festering in the Arab world. Russia, the West,

Herds are driven 40 miles to desert wells.

the East and the Middle East are boldly bidding for Khalifa's emotions. The appointment of John L. Tappan as U. S. Ambassador to Tripoli was countered by the appointment of Nikolai Ivanovitch Generalov as Russian Ambassador. Generalov was the minister to Australia when Petrov defected to the West.

Egypt is taking a big hand in the intrigue, with interests common to the Soviet bloc. Ambassador Tappan says, "Unless the U. S. quickly develops a dynamic policy toward Libya, we'll be lucky to keep the lid on another six months." Observers say Washington is blind to Libya's strategic position in the Middle East.

Libya is composed of three provinces. Cyrenaica, Tripoli, and the desert province of Fezzan. The Arabs have the dominant

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role. The original inhabitants of the country, the Berbers, were conquered by the Arabs soon after the time of the Prophet, and are not now politically important. A large part of the Jewish population has drained off to Israel. The Italians, who poured into the country under Mussolini's flamboyant colonization plans, are shrinking also and have no citizenship.

The country is poor—in soil, and apparently in all natural resources. On its own it faces a gloomy future. Presently it is being held up by the United Nations, by the United States through Point Four technical assistance and Wheelus air base, and by the British, all represented by a confusing swarm of commissions, agencies, committees, and advisory groups, all from the Infidel nations. The Moslem Arab is accepting the aid, but he is grateful not to the West, which brings him blessings, but to Allah. The politicians of the Arab world often seem to Westerners to regard foreign aid as so much baksheesh; they bow deepest to the one who gives the biggest baksheesh. Then they go back to their long-time policy—The Arab world for the Arabs.

Editor's Note: THE FARM QUARTERLY is grateful to the personnel of the various foreign agencies in Libya for their help and co-operation in the preparation of *Oasis Farmer*. Especially helpful and generous were W. J. V. "Jimmy" Taylor, of FAO, and Patrick J. Mahoney III, of the U.S.I.S.

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CAN FARMERS STRIKE?

(*Continued from page* 69)

must do for its members and not delegate to others to do—bargaining is one of these.

How could a labor leader hope to know all of the intricacies of farming that will influence the bargaining. How could he know, for instance, that a strike of pea growers at the time the crop is ripe could be just as disastrous for the farmer as for the packer—that it becomes more like a game of Russian roulette, each hoping that the other will blow his brains out first, whereas a strike before planting time has less risk and more leverage for the farmer.

And no one knows, but a farmer is in the best position to find out, how organized farmers could control the price they get for their meat animals. Only time and experimentation will tell. Some Iowa hog raisers have suggested that an organization of farmers could set a minimum price and then control the market by collectively agreeing to hold back a portion of their hogs whenever the market slumps to the minimum.

What the labor leader knows very well and what the Detroit farmers learned is that a strike in one city or area can be broken by unorganized farmers in another and that only the solidarity of all farm groups will stop this.

The labor leaders who went through the big organizing period of the 'thirties will also know some of the problems farmers will face, because they are the same problems labor faced. They know, for instance, that if farmers begin to bargain collectively, there must be some machinery set up—as there is in the labor field—for elections to determine which organization represents the group of farmers and just what group of farmers is an appropriate bargaining unit. In the Detroit case, would all the farmers supplying milk to the Detroit area be the appropriate bargaining group or would it be more appropriate for the organization to bargain separately for those farmers who sold milk to each individual dairy?

Labor leaders would also recognize the need for some form of conciliation and arbitration machinery to help bring about a solution to bargaining. And more than anyone else they will know of the need for a legal form of protection for the individual who sticks his neck out and stands up for himself or the group. Labor people know from grim experience that when a group organizes to bargain, the best way to break the organization is to smash the leaders.

Every consumer is conscious of the fact that there should be some protection of the public to prevent exhorbitant price increases. In Detroit, the farmer got a raise of 59 cents a hundred and the public was given a cent and a half per quart raise,

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or around 50 per cent more than was paid the farmer.

A Strike Is a Strike

The real power and danger of an agricultural strike dawns on farmers when they realize that New York, Chicago, Boston, Philadelphia, Detroit, Los Angeles, and all of the other giant cities where people live on concrete and garden in flower pots, could be starved in a week if farmers refused to ship them food. Indirectly they say that effective organization will eventually be used to exercise this vast power. They say it when they complain, "When they've busted all of the farmers and corporations take over farming; then you'll see agricultural prices that will make your hair stand on end. When a few big corporations can control agriculture they'll dole out the food to the cities at their own prices."

And when they say that, some of them have a wistful note in their voices and go on to say that farmers could do the same if they would just realize their power.

What they may not understand is that there is more to complete organization than meets the eye. In complete organization, there is also a ruthlessness that they would prefer not to notice. A strike is a ruthless, sometimes a cruel weapon. And farmers who plan to use the strike weapon should face up to it.

Many rural newspapers wrote about the strike. One typical editorial said, "We salute the Detroit farmers in their strike to better the price of milk. But they should remember that their neighbors have just as much right to ship their milk as the strikers have to withhold it, and they should take care not to infringe on this right." One farmer wrote in to say that unfortunately the only way unions ever won a point was to close the shop tight and in this case the only chance the organized dairyman had to win was to stop others from shipping their milk. Thus the issue was joined.

A strike is a strike. Almost always it results in an infringement of minority rights. It is not just quitting one kind of farming in order to do work that pays more and is more pleasant. A strike is the ultimate extension of collective bargaining—it is a refusal to deliver products or

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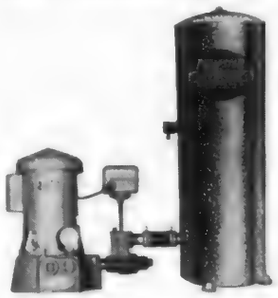

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Dempster Multi-Stage jetmasters are designed for volume, extra pressure from extra depth. Available in 1, 1½, 2 and 3 H.P. in two and three stage models.

Designed for the Home, Barn, Lawn and Garden requirements of busy farms.

Wherever you need running water—and at whatever level your source is—there is an efficient, economical Dempster Water System to meet your requirements.

For more than 77 years Dempster Water Systems have earned a world-wide reputation for their rugged simplicity and high delivery—a combination resulting from sound Dempster engineering and Dempster quality control. Over the years of use, your Dempster Water System will prove itself lower in operating and maintenance cost, more consistent in its volume and pressure efficiency.

Write for the new book "There's a Profit in Running Water"—illustrating and describing Dempster Water Systems.

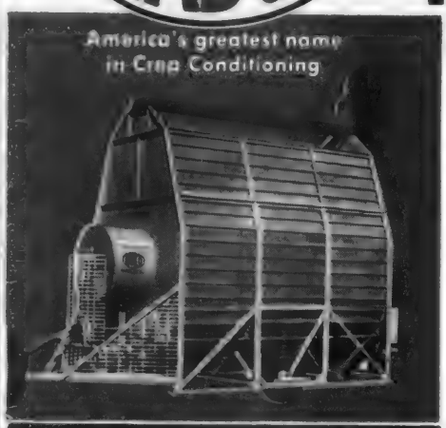
At Your Service— 77 Years of Water System Experience

DEMPSTER MILL MFG. CO.
Beatrice, Nebraska

MORE for your money!

HABCO presents the NEW "400" GRAIN DRYER

(400 bushel shelled corn capacity)



RECIRCULATES AS IT DRIES

LP GAS BURNER—
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PTO DRIVE

UNSURPASSED FOR

- UNIFORM DRYING—Recirculating eliminates wet spots
- FAST DRYING—20% reduction in drying time
- SAFE DRYING—Thermostat heat control; automatic safety controls
- QUALITY DRYING—No damage to oils or food value of grain
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FIVE OTHER DRYER MODELS

Dry all crops including hay. Portable, stationary dryers; indirect, semi-indirect heat; LP, natural gas or fuel oil. Also batch, recirculating, single pass drying bins.

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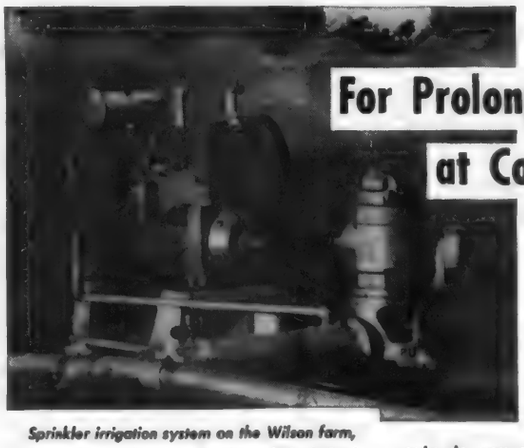

For Prolonged Operation at Constant Speed, Choose RED SEAL... It's Built for the Job

Sprinkler irrigation system on the Wilson farm, Lexington, Nebraska. Continental Red Seal Model M-363 operating on natural gas drives the deep well pump.

There's a big difference between rolling a car over a smooth highway, with frequent rests and plenty of coasting, and dragging a heavy stream of water up from the depths of the earth, hour after hour, day after day, and week after week. That's why it pays, when laying out your irrigation program, to choose power engineered and built for the really tough jobs. Not only do you save in maintenance costs by choosing the right engine in the first place; you also clinch the advantage of having water where and when you need it, all season long . . . and this may make all the difference between black ink and red. Continental Red Seal irrigation power is the product of engine experience dating from 1902. It is available for use on all standard fuels, including Diesel oil and LPG, and it's backed by service and genuine Red Seal parts from coast to coast.

• • •

Continental Motors Corporation
MUSKEGON, MICHIGAN

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labor and, above all, it is a refusal to let any other person or group take over the market or destroy the bargaining effectiveness of the strike. It means the imposition of the will of the majority upon those who would destroy the bargaining position of the group. The intent is always to achieve majority rule through persuasion, but, all too often, the situation gets out of hand and results in the use of force.

These are the facts of life, the realities of the situation. Can farmers strike? Certainly; they have proved that. Should they strike? That is a question for all of us to ponder. Will they strike? The Michigan farmer has shown that when high production costs and low prices begin to crush him, he will protect himself and his family even if it involves a strike. Right now the farmer is the odd ball in a flourishing economy. If the pressure on him is reduced by increasing his market, domestic and foreign; or by increasing his income by higher prices, higher supports, or through some subsidy such as the land bank payments, he will remain placid. He must have relief from economic pressures—relief in the market place, from government, or through his own action. Organization for bargaining, with the strike the chief weapon, is probably the best way he can help himself. He has shown that he can use this weapon effectively for his own protection.

MAYRATH has ONLY 2 ADVANTAGES

1. The Best Machines
2. The Lowest Prices

MAYRATH
DODGE CITY, KANS. COMPTON, ILL.
World's Largest Selling Augers and Elevators

FIELD SHELLING

(*Continued from page* 42)

a better job all around with the moisture at about 25 per cent. The shelled corn goes into a mounted bin. Our truck holds 300 bushels, the same as our drier. We spot the trucks at the ends of the rows and the man running the picker-sheller moves them as needed. You can get along with a minimum of help. It used to take an extra man to haul and switch the wagons when we used a regular picker.

"We could push the picker-sheller faster, but we don't aim to average much over 10 acres a day, for right now 1000 bushels a day is our top drying capacity. Of course, you have to be fixed to handle shelled corn, with a drier and shelled corn storage. But you save a lot of corn and the early harvest gives you a chance to get your wheat on early or to plow early so the wet cobs will rot quickly, without using up nitrogen and holding back the next year's crop. Early harvest also gives you a chance to pasture stalk ground while the stalks are still green."

Which Type of Field Shelling for You?

The new machines are no radical departure from conventional harvesting equipment. Mount a corn sheller on a standard picker and you have a picker-sheller. No husking bed is needed, for husks comes off in the shelling process. The ears are snapped from the stalk in the usual manner by snapping rolls, then elevated to the cylinder of a simple sheller. Shelled corn is delivered to a mounted bin; the cobs and husks go on the ground.

Corn combining follows the same pattern. Early attempts to take the entire corn plant into the combine have largely been abandoned by machinery designers because of overloading difficulties and excess strain on the combine. On current models, a regular corn-picking unit is attached in place of the sickle-bar grain header. Only the snapped ears of corn reach the body of the combine, which serves primarily as a corn sheller. Com-

NORTHERN BOB-WHITE QUAIL

"PLANT FOR A HARVEST"

Mature Birds, Sept. 1st to Dec. 31st delivery. **$3.00 per pair.** Started Chicks, July to October (5 weeks old) 20 **Birds $18.00.** Young Birds (8 to 10 weeks old, 2/3 grown, ideal for restocking, for sale July to Nov., **10 pairs for $23.00.**

CHUKAR PARTRIDGE

Native of Karachi, India, easy to raise, 3 times as large as Bob-White and just as good eating.

Chukar Chicks, June to Aug. (2 weeks old), **20 chicks for $15.** Young Chukars, July to Sept. (6 weeks old), **20 chicks for $25.** Young Chukars, Aug. to Oct. (10 weeks old), **20 birds for $40.** Mature Chukars, Oct. to March, **5 pairs for $30.**

Minimum Order: 10 Birds

All prices F.O.B. Joplin, Mo.; 1/3 deposit required with order and balance C.O.D. FREE booklet of instruction with each order. Write for facts about Successful Restocking.

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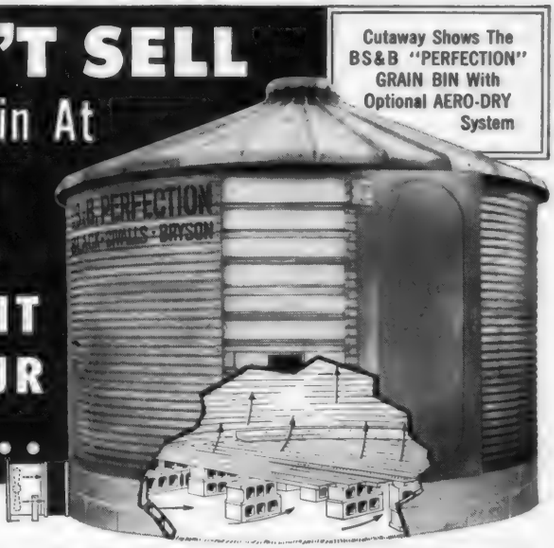
DON'T SELL Your Grain At Harvest Time . . . **STORE IT ON YOUR FARM . . .**



Without Risk For Top Market!

More than 500,000 farmers and over 25 agricultural colleges and experiment stations have already *proved* the soundness of storing grain crops on-the-farm at harvest time, rather than selling on a depressed market. A large share of them prefer BS&B PERFECTION BINS for crop storage, and if drying is required—BS&B AERO-DRY Systems. They know that with PERFECTION it can be done at minimum cost and with maximum safety to the grain in storage. As a result, they are able to sell their crop at a substantially better price than it would have brought at harvest time!

Look What Happened To Oats in '55

Many farmers sold oats last June for as little as 55c a bushel—scarcely enough to pay for their seed, fertilizer and harvesting without considering a fair return on their labor and an investment of from $12,000 to $20,000 in farm equipment that it took to raise the crop to maturity!

Yet, not all the oat farmers found themselves in this predicament. There were many who refused to sacrifice their hard year's labor on a 55c market! They were the ones who took a Commodity Credit Corp. loan and put their crop into "on-the-farm" storage in BS&B PERFECTION GRAIN BINS to await a more favorable price.

Here's how well they were rewarded for their sound business judgment: By February of this year, oats were bringing 95c a bushel on the open market—a price differential of 40c a bushel over harvest time prices and 22c a bushel over CCC loan price!

If you'd like to store your crop this year, but still need *cash* at harvest time, you can get not only the CCC crop loan but also a self-liquidating ASC loan to buy the necessary BS&B PERFECTION BINS and AERO-DRY Systems! Here is how it works:

PERFECTION GRAIN BINS	PERFECTION AERO-DRY
Up to 80% Equipment Loan	Up to 75% Equipment Loan
Straight 4% Interest	Straight 4% Interest
5 Years to Repay	4 Years to Repay
100% Tax Write-Off Over 5 Years	100% Tax Write-Off Over 5 Years

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Please send me complete information on BS&B PERFECTION GRAIN BINS and PERFECTION AERO-DRY SYSTEMS.

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CITY_____ STATE_____

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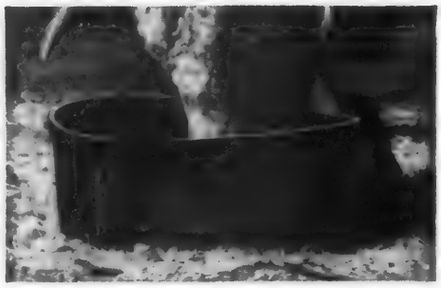

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They are rugged—tough and flexible—crushproof, rustproof, leakproof and weatherproof

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Please send me full information on ALL-PURPOSE, ALL-RUBBER LIVESTOCK FEED TROUGHS in ½-, ¾- and 1½-bushel sizes.

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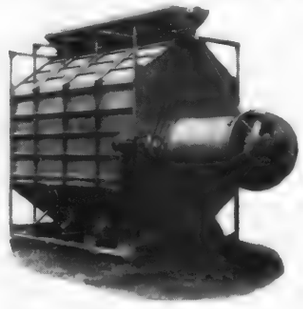
Now You Can Solve Any Crop Curing Problem with HARTZELL Drying Equipment



And you can trust your Hartzell representative to recommend the equipment which is exactly right for your drying needs because Hartzell makes all types.

For complete details, check the items which interest you on the list below and mail the coupon today.

HARTZELL *propeller fan co.*
Div. of Castle Hills Corp.

Dept F., Agricultural Division, Piqua, Ohio

Please send me information on how I can make my farm operation more profitable by using:

- ☐ Portable Crop Drying Equipment
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City_____ State_____

bines shell dry or wet corn very well with only minor adjustments of cylinder clearance and speed.

Both corn combines and picker-shellers harvest corn with similar efficiency and low operating costs in the field. Gasoline use averages from 1 to 1½ gallons per acre. Combine owners claim to cover more acres per day, but with both combines and picker-shellers, when the ground travel exceeds 2½ to 3 miles per hour, gathering losses mount sharply. The choice between the combine and the picker-sheller is really a question of cost and usage. Where small grains are also harvested, the cost of a combine can be spread over more acres to justify the higher initial investment.

Only one power take-off, pull-type picker-sheller is on the market. It is made by Case and sells for $2149, but like all farm equipment, local prices vary. At present, Massey-Harris produces the only self-propelled model designed for corn alone. It sells for $4,017. The Minneapolis Moline Uni-Tractor, a self-propelled basic power unit on which various harvesting implements can be mounted, retails in the neighborhood of $2500. The picker-sheller attachment costs about $1600.

Massey-Harris, John Deere, and International Harvester manufacture corn snappers for use with their own combines. The John Deere 10-foot-cut combine costs around $4,500 with $1,400 additional for the corn attachment. The Massey-Harris corn attachment costs $1,300 and can be used on several of their combines, which begin at $4,600 for a 10-foot-cut and go up to $6,200 for a 16-foot-cut. All of these machines handle two rows of corn and have bins holding about 40 bushels of shelled corn, so trailing wagons need not be used.

Where capacity is not so important and the use of trailing wagons is not considered a hindrance, field shelling can be done with a smaller investment. Owners of Dearborn one-row pickers can add a shelling attachment, to be bolted on the picker in place of the regular husking bed, for as little as $396. The sheller, like the picker, is driven by the tractor's power take-off. Several companies also produce pull-behind shellers for use with any pickers, one- or two-row. These sell for less than $1000. They are designed to handle up to 200 bushels per hour and may be used for stationary shelling as well. On such lightweight, two-wheeled models, a small gasoline engine drives the sheller. Ear corn is fed by the picker's elevator into a hopper of the sheller and the shelled corn is then augered into a trailing wagon. Cobs are discarded. Among the manufacturers of these shellers are the Fleischer-Schmid Corp. of Columbus, Nebraska, the Hopper Machine Works of Bakersfield, California, and the King and Hamilton Co., Ottawa, Illinois. In purchasing a separate mobile sheller, it is essential that its capacity match that of the picker.

Make Your Corn Harvest
PAY MORE
with FLEISCHER-SCHMID Equipment!

BUFFALO
Trailer Model Corn Picker-Sheller Unit

- **Turns Any Picker Into A Picker-Sheller**
- **Shells Up To 100 Bu. of Ear Corn Every 30 Minutes**

One Speedy Operation takes care of corn harvesting! You pick early, avoid costly field losses. And the *extra* yield you get helps pay for the unit!

No Waiting For Corn To Dry before shelling. You beat the frost, have corn ready to store or ship in fraction of the time since Flash-O shells *and* cleans!

BUFFALO
Corn Picker-Sheller Attachment

Converts All Dearborn-Wood Bros. models into picker-shellers. Interchanges easily with husking bed. Pick and shell what you want, then switch over to picking ear corn. It husks... it shells... it cleans!

Write today for free literature on these products

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fun-work yard tractor
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WHEEL-HORSE

This amazing little tractor turns yard work into carefree FUN. Just let Wheel-Horse "Ride-Away" do the work around your own place while you just sit and steer. Does lawn jobs in a jiffy... 3-gang mower cuts 5-ft. swath! Clears snow with nary a huff or puff. Plow... Cultivate... Use any of 22 attaching tools to do *all* yard and garden jobs. This versatile fun-work tractor has 5 forward speeds and a reverse! It's powered by a husky 2½ h.p. (or 3½ h.p.) engine mounted on heavy channel steel chassis. Complete line of garden tractors from 2 to 8 h.p.

22 Tools for all Garden Work

Write for Details and Name of Dealer

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Operating Costs

With any field shelling equipment, there are, of course, other considerations beside the initial price to complicate the cost picture. In Iowa tests, picker-sheller harvesting was cheaper than regular picking followed by stationary shelling when more than 45 acres were harvested annually. Depreciation was included in those calculations. Where 45 acres or less were harvested, one- and two-row pickers and picker shellers all totaled about 7 cents per bushel for picking, shelling and hauling. Beyond 45 acres, costs for operating all three types of equipment decreased, with the most rapid decrease through picker-sheller operation. At 150 acres, costs leveled off, averaging 4 cents per bushel for picker-shellers, 5 cents for two-row pickers and 6 cents for one-row pickers.

California engineers John R. Goss and Robert G. Curley report that custom harvest is cheaper than owning equipment where fewer than 30 acres of corn are grown. Under California conditions, where from 30 to 150 acres of corn are raised, harvest is least expensive by means of a combine with corn attachment, if the farm grows enough small grains to support a combine. Above 150 acres, corn harvesting costs were lowest when a two-row picker followed by a pull-behind sheller was used. Custom harvest was figured at $10 per acre plus $2.50 per ton for picking, shelling and hauling.

Expenses do not end when the corn has been shelled. On the market, the price of No. 2 corn is based on shelled corn at 15.5 per cent moisture. Discounts are heavy as the moisture increases. Safe storage (and government sealing) of shelled corn calls for a maximum moisture content of 13 per cent. With field shelling machinery, the old adage runs true that you can't get new farm tools to work without adding other items of equipment. Field shellers have to be accompanied by grain driers and shelled corn storage. Driers range from $1000 to $4000. Custom rates for drying average from 5 to 15 cents per bushel. But with only half the space required for ear corn a farmer can cut his storage costs drastically. Self-unloading wagons and fast, efficient ele-

Use the Innes
Gets ALL the grain — no wrapping, shelling or clogging. Easiest there is to put on
and take off. Built to last. Ask your Innes dealer or write Innes Co., Bettendorf, Iowa, TODAY!
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5-HP GRAVELY Makes Tough Jobs EASY!

Gravely does jobs other tractors won't . . . because Gravely has that *extra* power for tough mowing, gardening, field and farm jobs.

And you get *more* when you get Gravely: All-gear drive, power reverse, simple, easy operation, power attachments *securely* mounted, quickly interchanged by only four bolts!

PLUS . . . 21 JOB-RIGHT TOOLS!

Your choice of 21 tools . . . used with one versatile tractor that saves you time, work, worry, *all year long.*

"Power vs. Drudgery" booklet shows how Gravely solves your upkeep and gardening problems. Write for it today! New Easy Pay Plan. Starter optional.

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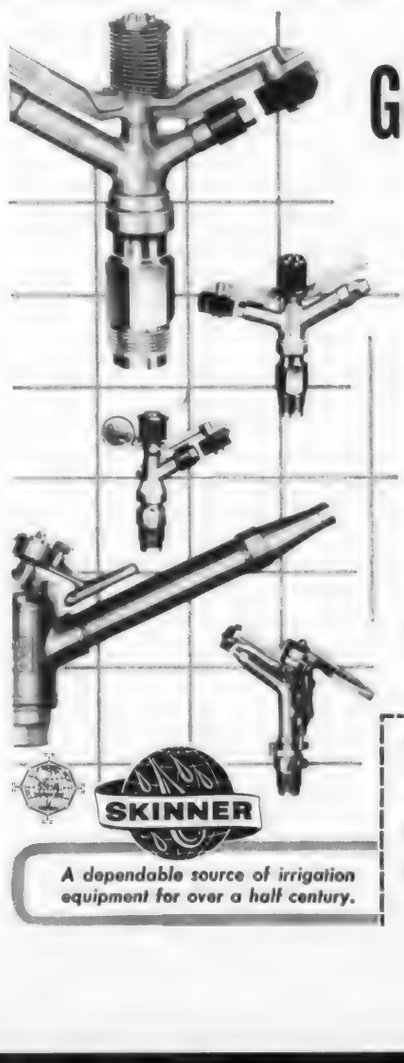

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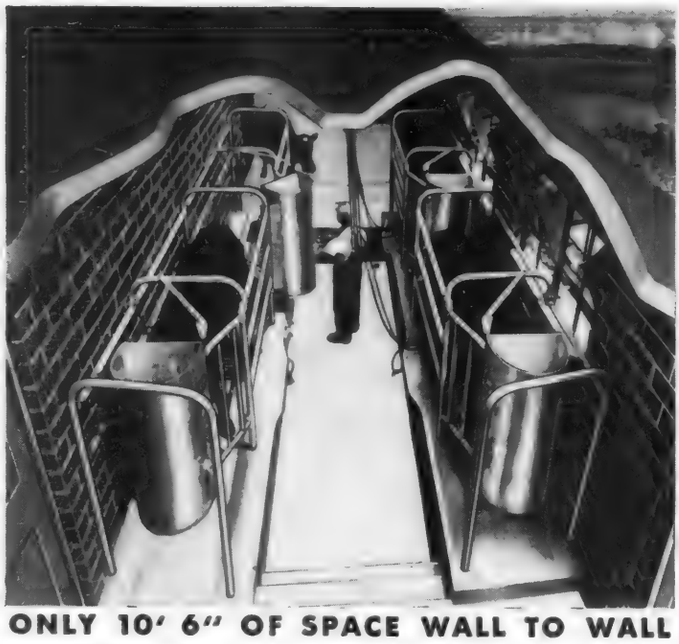

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COWS ENTER FROM HOLDING AREA
Entrance-exit doors open from pit. You hardly move. Cows bring milk to you.

MEASURED FEEDING JUST TURN CRANK
Feed is measured automatically from hopper into pan from overhead bins.

MILK FASTER IN FAR LESS SPACE
Milk 30 cows per hour. Two steps take you to any chore—saves time, work.

Can you think of an easier way to milk cows?

CLAY WALK-THRU PARLOR STALLS SAVE WORK...SAVE TIME

Milk faster—save steps, work and time, get cleaner milk—with Clay Walk-Thru Stalls. One man easily handles 30 cows per hour in a low-cost four stall parlor.

GRADE "A" MILK plant requirements can be met at low-cost . . . efficiency is greatly improved and cost of hired help is cut to minimum.

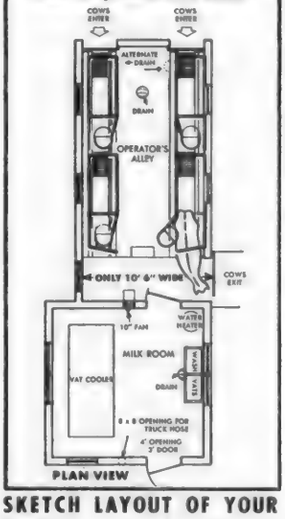
NO STOOPING, bending, carrying. Everything is handy in a small area. Work is cut in half . . . saves hours each day.

ALL GALVANIZED, built to last . . . low maintenance cost is built-in . . . lasting strength and appearance.

LOW BUILDING COST, because stall acts as alley, requires less space, can cut remodeling or building cost as much as 30%. Pays for itself in construction savings.

FREE—New, 1956 Milking Parlor Book. Ideal to help in planning your new dairy plant. Contains suggestions on arrangements and full information on all types of stalls. Write today.

Typical Grade "A" Milk Plant with Clay Walk-Thru Stalls



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(Check one) STUDENT_____ FARMER_____

vators speed the handling. (For a detailed article on crop driers see The Farm Quarterly, Spring, 1956, page 66.)

Recommended Practices

Equipment for field shelling and grain drying runs into dollars but it boosts yields and selling prices. The big advantage of combining and field shelling is in early harvest. Losses from delayed harvest can be staggering; total loss of 15 to 20 per cent of the yield are common where corn is not picked until six or seven weeks after maturity.

Corn is considered mature at 34 per cent kernel moisture, at which time the cob runs about 54 per cent moisture, far too high for satisfactory picking and storage. Shelling at that stage is inefficient. Most authorities recommend that field shelling begin when the kernel moisture reaches 26 per cent (the combine can go to work on corn of 27 to 30 per cent moisture), about 10 days after maturity. At that time it should be possible to achieve the maximum harvest. In Nebraska, tests show that field losses increase about 3 per cent per week as the corn becomes drier. Picking for safe ear corn storage is generally delayed until the corn reaches 18 or 20 per cent kernel moisture, when field losses average between 9 and 12 per cent by the most efficient standard picker methods. By conservative estimate, early harvest by field-shelling equipment should save 7 per cent of the crop. In a 100-acre crop at 80-bushel yield, 7 per cent would amount to 560 bushels of corn, more than enough to keep up the annual installments on field-shelling equipment, drier and shelled corn storage.

Agricultural workers have only begun to study the new equipment in relation to cultural practices, rotations and marketing methods. Investigations completed to date have been mostly concerned with the practical aspects of equipment operation. L. W. Hurlbut, Nebraska engineer, favors a planting schedule which allows for staggered harvesting dates to minimize losses. California scientists recommend the selection of well-standing corn of medium stalk size for best harvest by combine.

Ohio recommends an easily husked variety for harvesting by picker-sheller. Husking qualities greatly influence shelling capacities of such equipment. Ears free of husks will shell up to three times as fast and do it with far less power. Ohio workers also advise that the sheller hopper be kept filled at all times. Shutting off the sheller at the turns or increasing the ground speed in poor corn will do the trick. As on any corn sheller, the hopper must constantly be kept loaded to do a clean job of stripping the cobs. With a combine, clean shelling is accomplished whether one or a dozen ears are passing through the machine.

Corn varieties apparently have little effect on shelling qualities but moisture is very important. While moisture does not affect the speed of the shelling, kernel damage, amount of debris and loss of unshelled kernels increases rapidly as moisture increases. The challenging aspect of field shelling is this: Corn picks best at 25 per cent moisture, but shells most efficiently under 16 per cent. How can these factors be coupled to afford a good job with a minimum loss? The engineers are still working on the answer.

New Models On the Way

You'll be hearing a lot more about the newer field shelling machines before the season is over. Corn headers to be attached to any pull-type combine may soon be commercially available. To date, corn headers are limited to use with two makes of self-propelled combines only. More small companies are going into the production of shelling equipment to be used with standard pickers. Oliver, Allis-Chalmers, and New Idea are among the larger companies which expect to have picker-shellers or corn attachments for combines ready for the 1957 season.

Competition will bring down the price of field shelling equipment. The gain in early harvest, the ease of handling shelled corn and the saving of storage space are certain to appeal to more and more farmers. There are two ways around the stumbling block of high-priced drying equipment. Custom drying is one. In many communities cooperative mills are purchasing driers

to do custom drying at reasonable rates. Livestock farmers with airtight silos have another choice. Corn of high moisture keeps well over the winter in a tight, glazed masonry silo and can be kept for several seasons in a Harvestore silo.

The corn crib is still a familiar farm building. At the rate at which field shelling is taking hold, though, it may soon be as rare as the horse barn.

FAST MILKING

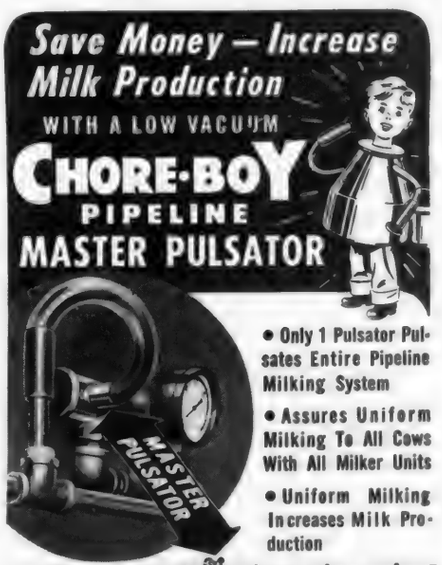
(*Continued from page* 39)

hormone has lost its effect, the let-down will stop.

It becomes a matter of striking while the iron is hot, or, if you will, milking while the milk is flowing.

The immediate and most obvious result of incomplete milking is a loss of milk; and, consequently, a loss of money. But the dairyman who consistently fails to milk out his cows completely is inviting even greater losses in the future.

The rate of milk-making that goes on inside the cow depends on the amount of pressure in the udder. The lower the pressure, the faster she makes milk. When the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Harvey Moeckley of Polk City, Iowa, (left) found that 1500 feet of corrosion-proof, lightweight polyethylene pipe could be laid and connected in half a day. Pipe and fittings cost less, too.

More Water—More Profits

. . . And new flexible polyethylene pipe can slash costs of bringing your farm water supply system up to date

Can your cattle, pigs, sheep, and hens get *all* the water they want to drink, *any* time they want it? If not, you're losing profits by failing to make the most of the cheapest feed your money can buy — water.

Scientific tests have compared live stock watered only twice a day, with stock having a constant supply of fresh water. These tests show that it's worth almost any farmer's money to put in enough extra pipe to allow for an ever-ready system. Recently, many farmers have found they can now afford to put in such a system because of the great savings made possible by the use of polyethylene pipe.

For instance, after Harvey Moeckley had made a careful study of his Polk City, Iowa, farm, he decided to put in 1500 feet of extra water pipe. And he found that polyethylene gave him substantial savings on every step of the job. First, polyethylene pipe costs less than metal. It's so lightweight that one man can carry a 300 foot coil of it on his shoulder. And only a knife and screw driver are needed to connect fittings.

Then, too, since polyethylene pipe can be purchased in 300 foot lengths (while the standard length of steel pipe is 21 feet), the time saving in couplings alone was over 1400%. And pipe made from polyethylene swings around obstacles and turns corners—another tremendous time and money saver. In fact, the plumber whom Moeckley hired, laid and connected the entire 1500 feet in half a day.

Perhaps you, too, are interested in expanding your farm water supply system to insure an ever-ready supply of drinking water for your live stock — and for your home. If so, consider the many money-saving features of polyethylene pipe. Send coupon below for more information—without cost or obligation.

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pressure reaches a certain point, her milk-making machinery shuts down. It is easy to understand why, if all the milk is not ejected from the alveoli at milking time, the pressure will quickly build up again and milk synthesis will stop. Often the pressure becomes so great that some of the milk ingredients go back into the blood. This is called resorption of the milk, and when it occurs the drying off process sets in.

Dr. Thomas Ludwick, associate professor of dairy sciences at Ohio State University, puts it this way:

"The rate of milk synthesis depends on the flow of blood through the cow's udder. If the cells (the alveoli) in the udder are full of milk, the pressure increases and slows down the blood flow. This, in turn, causes the milk manufacturing to lag and results in greatly decreased production."

Dairymen who are increasing their production by milking three times a day are relieving the pressure more often and allowing the rate of milk synthesis to speed up.

An understanding of the physiology that makes the milk available to a milker demonstrates why it is important to begin milking promptly after the stimulation and to milk out the cow as rapidly as possible. Of course, fast milking means different things to different cows. Many cows will milk out completely in two minutes. Others will require up to eight minutes.

The practice of rapid milking must be flexible enough to take into consideration the marked individuality of every cow. But each cow must be milked out as fast as she will give up her milk. Slow, sloppy milking results only in increased labor and decreased production. Often it results in mastitis and dry udders.

For the sake of your cows and your milk production, always remove the milking machine when the milk ceases to flow. On a dry teat, a milking machine becomes a mechanical monster. It can injure severely the delicate inner lining of the teat and give mastitis bacteria an opportunity to enter the cow's bloodstream.

The story is told of a dairyman who was called to the telephone shortly after he had put a milking machine on his best cow. The cow was a fast milker and usually gave her milk in two to three minutes. After a lengthy chat on the phone, the dairyman returned to the barn and took the machine off the cow. He had a bucket of blood.

Although this is an extreme example of poor milking, dairymen every day are suffering less obvious losses because they are failing to manage their milking routine.

Stripping by machine can be a big time-saving factor. It saves having to return to the cow to strip her after taking the machine off and putting it on the next cow in line.

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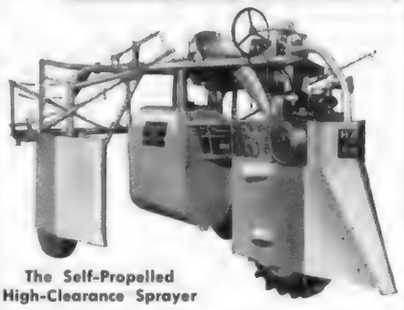

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Some dairymen argue that machine stripping can injure the teats and cause mastitis, but there appears to be little danger of this if the stripping is not prolonged.

The main arguments against hand stripping are that it often adds contamination to the milk, and eventually can throw the cow out of good milking habits. The majority of dairy experts believe that prolonged hand stripping will condition the cow to depend on it for a complete let-down. This, of course, can wreck a well-managed milking plan.

Most cows can be trained to give all their milk in three to four minutes. Some cows, however, are prevented from ever giving up their milk rapidly. A slow milker may have small teat openings or she may have an inherited lack of ability to ever let down her milk completely. The slow milkers should not be allowed to interfere with the normal milking procedure. They should be put at one end of the line to prevent them from interrupting a fast-milking routine.

Some dairymen cull cows that won't milk out in five minutes or less. They reason that while a slow-milker may produce well, the time spent getting the milk is not worth the higher production.

Keeping your cows contented is a vital

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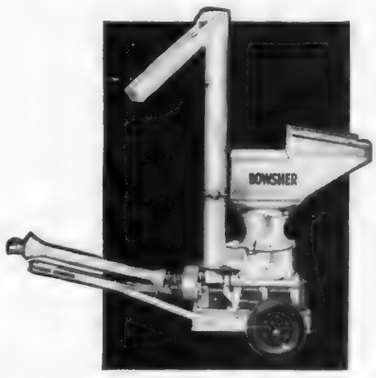

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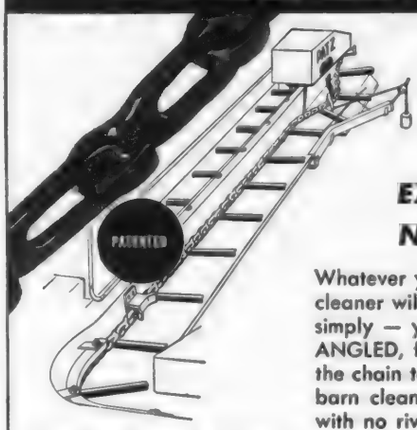

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part of any good milking plan. Again, the reason is found inside the cow. Experiments have shown that sudden noises, strange persons in the barn or mistreatment will prevent the cow from letting down all her milk. Distractions and abuse are as much of a stimulus (in the reverse) to the cow as the washing and massaging of her udder. They also act to send a signal to her brain. But this signal releases a substance in her blood that halts the let-down process instead of speeding it up. The harmful hormone is called epinephrine, which is commonly known by its trade name, adrenalin. It interferes with the action of the oxytocin and results in an incomplete milk harvest.

"Well, it looks good on paper," you say, "But does it all work out that smoothly when you take it to the barn?"

As part of an answer to that question, take a look at Jack Caldwell who operates a 115-acre dairy farm near Burlington, Ky. He has a small herd of registered Brown Swiss, and—although totally blind since boyhood—he milks his thirteen cows twice a day by himself.

"I use two buckets and one milker head," Caldwell says. "I have one slow milking cow, so I start with her and work on down the line. I wash her udder and get her started milking. Then I wash the udder of the next cow, strip the first one by machine and put the machine on the second cow—and so on down the line."

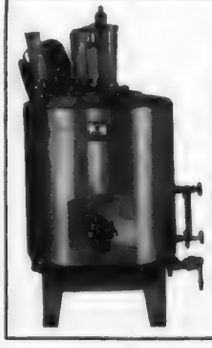
Caldwell believes that most cows can be trained to give up their milk rapidly. "But they can become sloppy about it, if they're handled sloppily," he said.

The Kentucky dairyman formerly used a cooking timer to remind him when to take the machine off the cow. "But I soon got the feel of it," he said, "and now I'm able to judge the time pretty well without the timer."

To Caldwell, a good milking procedure means getting the job done without distractions. "You can't feed calves or do odd jobs around the barn while you're milking and expect to get good production and keep your cows healthy," he explains.

Ray Starbuck, dairy extensionist at Ohio State University, believes that every dairyman must recognize the individuality among cows in his herd when he sets up a milking routine.

"Any milking procedure that fails to take into consideration different reactions



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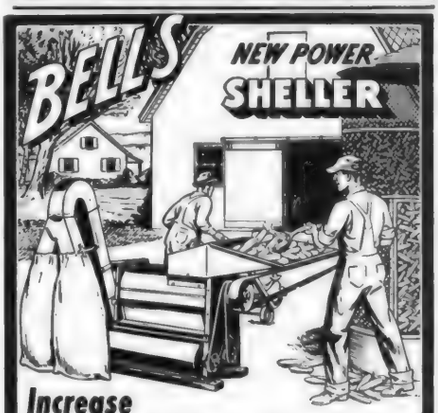

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by different cows is not a good one," he said. "The idea is not to be in a great hurry when you milk, but to do a good job in as short a time as it takes to get all the milk from each of the cows in your herd."

Starbuck, who operates a 100-acre dairy farm near Plain City, Ohio, said that he has found a wide variance to response among his own cows.

"The milking-out time required by each cow depends on the length of the let-down process and the shape of the udder," he said. "A dairyman must recognize these differences if he is going to get good production and protect the health of his cows."

Starbuck employs all seven of the rules for good milking with the exception of machine stripping.

"Of course, it is purely a personal opinion," he said, "but I feel that hand stripping will save some udders. Stripping with the machine is advisable only if the milker is experienced and skillful."

As Starbuck points out, a good dairyman should know his cows and should make allowances for their variances. But in nearly every case, these variances can be fitted to the seven fundamental rules for good milking.

If you can put these rules into effect in your barn, you'll find yourself expending less labor for bigger returns. And no matter how you look at it, that means dairying profitably forever after.

THE AUTHOR: After he was graduated from the University of Kentucky, Jim Jordan worked on the editorial staffs of daily newspapers in Indiana, Kentucky and Florida. After publishing "*Review of Contemporary Poetry*" in 1950, he launched into free lance writing. He's married and likes to nose around in unexplored caves. This is his first appearance in THE FARM QUARTERLY.

HOME MIXED FEEDS

(*Continued from page* 53)

pound having the properties of the female sex hormone, estrogen. Tests at various experiment stations have shown that you can expect a 17 to 19 per cent faster gain with a saving of 10 to 11 per cent in feed per pound of gain. Ten milligrams per steer per day is the usual recommended amount.

Because the promiscuous use of stilbestrol could be dangerous to both cattle and men, its use as a cattle feed has been approved only if it has been incorporated in a carefully regulated premix and sold to commercial feed manufacturers to be mixed with normal supplements for beef cattle fattening rations.

Stilbestrol supplements should not be fed to any animal other than fattening steers and heifers. It should not be fed to any breeding animal, and bred sows and gilts intended for the breeding herd should not follow cattle getting stilbestrol.

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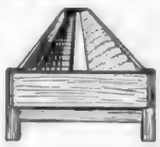

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Work at the University of Illinois shows that you tend to get the most benefit from stilbestrol feeding during the first 60 to 90 days it is fed. Therefore, if you start with a supplement containing stilbestrol about July 1 (when cattle start to need the protein in a normal year as pastures taper off), you will still have time under most feeding programs to get most of the benefit from stilbestrol. If you want to feed stilbestrol earlier than this, buy a supplement containing 10 milligrams of stilbestrol per pound and feed ½ pound per steer per day.

Finishing Ration for Medium and Common Steers: Keep steers on good roughage as long as they are gaining at least 1 lb. per day. Use one of the following rations which fits your feed supply:

Ration 1. Full feed corn silage, 2-3 lb. hay, and 1-2 lb. protein supplement for 60 to 90 days. Then start reducing the silage and adding grain (corn, oats, barley). Feed grain for 1 to 3 months, depending on the quality of the cattle.

Ration 2. Full feed 2 to 4 months on grain and hay free choice. Feed 1 lb. protein supplement per head daily during the last month or 6 weeks.

Ration 3. Full feed grass or oat silage and 5-7 lb. grain for 2 or 3 months. Feed 3-4 lb. hay per day. Then reduce the silage and add grain until steers are getting about 15 lb. silage and a full feed of grain during the last 1 to 3 months of feeding period. No protein supplement is needed, but 1 lb. per day will add enough bloom to the cattle to pay for the supplement.

Ration for the Very Common Sort of Cattle: In Iowa and down through Kansas and Missouri, too, there are lots of ordinary cattle that are being fed out on a ration that Bob Garst of Coon Rapids, Iowa, started using back in 1952. It calls for no hay, no pasture, and no silage. The molasses-urea mixture supplies the energy and part of the protein, and it is available ready-mixed from many feed mills. The complete feed formula is as follows:

14 pounds ground corn cobs (½-inch size maximum)
3 pounds ground shelled corn
1 pound soybean meal
3 pounds molasses-urea mixture (90 per cent molasses–10 per cent urea)

Steamed bone meal and salt are fed free choice. The advantages of the mixture are that it is cheap and can be mixed in any farm feed mixer. The molasses-urea can be poured over feed in the bunk if a molasses blender isn't available. The urea can be eliminated by increasing the amount of soybean meal to 3 pounds.

Emergency Rations

The succession of dry years, dust storms, floods, and otherwise bad feed years have made emergency rations a necessity in some parts of the country. Oat straw, wheat straw, corn cobs, cornstalks, soybean straw are all low grade roughages that can be used to take beef cattle and sheep

through the winter. To use these low-grade roughages you'll need good protein, vitamins and mineral sources in a supplement that most feed manufacturers can supply in a 30-32 per cent protein form. One that can be bought or mixed, which has had several years of testing and success back of it is the Purdue Supplement A (32 per cent protein).

Purdue Supplement A

650 lb. soybean meal
140 lb. molasses
140 lb. dehydrated alfalfa meal (17 per cent protein)
52 lb. bone meal
17 lb. salt
½ lb. vitamin A & D concentrate (4,540,000 U.S.P. units vitamin A and 567,000 U.S.P. units vitamin D per lb.)

The emergency ration recommended by a number of universities is to feed free choice the low quality roughage you have available and allow 2 to 3 lbs. per cow of the Purdue Supplement A. With growing steers or heifers, this amount should be increased to 3 to 3½ lbs. per animal.

There Is Help Available

Just about every good feed company in the country has a feed program that they can recommend if you have farm-grown grains to use. They can help you with feeding silage and hay. Many of them have field representatives who are nutrition experts. The service is there for you

YOUR TRAILER* SHOULD BE EQUIPPED WITH
BULL DOG
AXLE ASSEMBLIES

*AND ALL EQUIPMENT ON THE FARM REQUIRING TRANSPORTATION

BULL DOG straight or drop axles in single or tandem — capacities up to 10,000 lbs. steel axles — any width — and the famous safety-engineered "Torq-Less" axles for all types of trailers.

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SPECIAL STRAIN SCOTCH PINE per 1000
Very best Christmas tree strain. From seed collected by our men from selected parent trees. Healthy, sturdy, straight stemmed, rich color.
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to use. The Extension Service of your State university in many states will give you specialized advice.

When it comes to weighing, mixing and feeding, you are on your own. Scales, especially for supplements, are almost a necessity. Motor-driven and tractor-drive burr mills, crimpers, grain crushers, hammermills are all part of efficient feeding and can increase the digestibility of feed as much as 20 per cent. For bigger farms and ranches, the molasses blenders and dehydrators have made feeds more palatable and preserved the protein content. Self-unloading wagons and truck bodies can be used to speed up the job, save labor, and in some operations are doing the work of mixing in the supplements as the wagon goes down the feeding bunks.

It takes a smart feeder to buy, feed, and sell on the price schedule we have today, but someone is going to do it. With the modern equipment and new feed supplements, the efficient operator is not only going to stay in business, but he can make money.

THE MOON AND ANDY

(*Continued from page* 65)

Our veterinarian once stopped by to castrate a colt. Andy knew the sign was wrong, and protested. The vet said he "didn't give a damn about the moon." The colt almost died, but Andy loves horses too much to enjoy this sort of victory.

Andy puts up a tough argument because he has half a century of experience to draw on. Take the plank test.

"You take a board," he says, "and lay it on the lawn when the grass is growing. If that plank is put down in the light of the moon, in three days that grass will turn yellow, but it won't die. Do it in the dark of the moon and all the grass underneath will be dead in three days."

We found out, down through the years, that it was just as well, and a lot more peaceful, to let Andy have his way. Our skepticism bounced off his head like hail off a tin roof, although we made gallant efforts to counter his beliefs with the sober facts of science.

We found that belief in planting by the moon is as old as the pyramids and as new as the cornpicker. The stronghold for the belief has always been on the farm, among people who actually do the planting. Scientists, on the whole, have given moon planting the brush-off as a piece of superstitious hocus-pocus. Flammarion, the great French astronomer, was one of the few to give the theory a fair test. He concluded, "There is no material difference to be attributed to the moon." Flammarion's report was published in the United States in 1911 by the Department of Agriculture.

A German woman, who was more a swami than a scientist, spent ten years in pseudo-scientific experiments in planting

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Box 67, Storm Lake, Iowa

by the moon. She tried a variety of plants and vegetables. In testing wheat, she planted thirty selected grains in each of eight dishes. These were watered every two days for fourteen days. At the end of two weeks the plants were pulled up and the root, stalk and total growth was measured. Similar experiments were carried on with corn, lettuce and cabbage and such exotic plants as pimpernel, lovage, thyme, wormwood and rue.

After ten years of experiments, cautious Frau Kolisko announced that she was unable to make up her mind whether or not there was anything to moon planting. She made a slight exception of wheat. In this case, the maximum desirable effect came from new moon to full moon in August (these were indoor plantings) with the same period in September being somewhat less favorable.

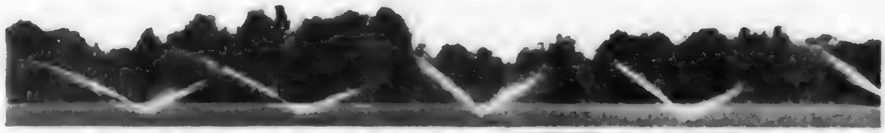
Dr. Harold S. Burr of the Yale School of Medicine attacked the problem with electrical gadgets. He placed two electrical contacts under the bark of a living tree and kept a record of the electrical potential between them. Once a month there was a slight but sharp increase in electrical voltage. He came out with a highly qualified endorsement of the moon, reporting that although no causal relationship could be shown, the increase in electrical potential could be predicted within 48 hours by the moon.

Agronomists at the agricultural colleges, who ought to be sure about moon planting, usually indulge in double talk when the subject is brought up. Professor R. R. Mulvey of Purdue confuses us with this comment: "The real controversy about planting by the moon is usually among those who adhere to the ancient practice. What may be the proper time to plant a certain crop by one individual is wrong according to another interpretation. It is between such individuals that the greatest satisfaction is derived in proving the other wrong —which they never do."

Professor W. M. Myers, of the University of Minnesota, was equally diffuse. He says, "Whether or not the moon has any influence on plants, it almost certainly has no effective influence on planting times. In this area planting dates are quite important, but for reasons not related to the moon.

"For example, with the planting of small grains in this area," he continued, "the earlier they can be planted, the better. Thus, they are normally planted as soon as the seedbed can be prepared in the spring. Any delay after that time is, on the average, found to result in decreased yields. Thus, waiting two or three weeks for the proper phase of the moon would, in fact, be extremely deleterious."

From a top scientist in his field comes a reasonable small voice in an oblique support of Andy's moon. Dr. Wm. A. Albrecht, chairman of the Department of Soils at the University of Missouri, with a wisdom compounded from age and experience,



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This Model SS-3H-10 CMC "Rain-Master" irrigation pumping unit, made by Construction Machinery Co., Waterloo, Ia., operates at pressures of 40 to 75 psi, with a pumping capacity of 150 gpm at 75 psi and 230 gpm at 60 psi. It is powered by a Model TFD 2-cylinder 15 hp. Wisconsin Air-Cooled Engine.

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WISCONSIN Heavy-Duty Air-Cooled Engines, "tailor-made" for irrigation service, offer not only efficient, trouble-free cooling in all field locations, in any climate, but of equal importance, provide continuous-service OPERATING DEPENDABILITY. Features include solid Stellite valve seat inserts, Stellite-faced exhaust valves and positive type valve rotators to assure low-cost maintenance. If the engine should "run hot" due to preventive maintenance negligence, an automatic high temperature safety switch shuts it off before damage can occur.

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LOWER THAN ANY
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(all f. o. b. factory)

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admits that faith must take up where science leaves off. He says, "While the word 'moon' was the origin of our calendar division 'month' we are too apt to forget that the seasons were not always tabulated to such a fine degree of accuracy as they now are. To man as a primitive the moon in its cycles may have been the only calendar and in speaking of planting according to the season, he was planting according to the moons. Now that persistence may have held on and come down to us so that some people still think they are planting according to the stage of the moon as we outline it by quarters as waning or waxing.

"However, some interesting research at Missouri considered the reflected light of the moon as it might be of significance in starting seeds. Many years ago some studies were carried on here which showed that tobacco seeds must be exposed to light if they are to germinate. Should they be harvested without having exposure to light they would not germinate. But by exposure to light as small as that reflected by the moon they will germinate and go forward. That work was done in the Department of Botany by R. R. Kincaid.

"That is cited to you to point out that hidden in the biological performances about us there are many factors with which we are not familiar. Then because of our ignorance we are apt to be 'down on what we are not up on.' Keeping one's mind closed is an easy performance but keeping it open and handling all that may come into it is something quite different. It is regrettable that in education we have not invented a can opener for the closed mind.

"So there is much empiricism in any profession including some of those standing most high in public estimate which carries the profession on much farther than we move by all the science and knowledge we generate ourselves.

"As a consequence I like to study some of these items which might be considered witchcraft or things of that kind. There was a time probably when things that are now included in the results of thinking about 'relativity' might have been considered as witchcraft too. So what is the atomic bomb and atomic radiation today would certainly have been considered witchcraft not too long ago. It would have been that especially when we discovered that it was coming in from the heavens as it were and we called it cosmic rays."

More than one scientist suggested that if there were anything in moon planting at all, it might be caused by the tidal powers of the moon. They explain that tides occur on dry land and in the atmosphere, as well as on the sea. Land tides bulge the earth upward four inches in north central U. S.

All this scientific palaver, however, doesn't bother Andy. He goes right on, firm in his beliefs and sure of his crops. He does have a sort of reminder in the form of an old bank calendar which hangs in his kitchen. Under the legend, "Expla-

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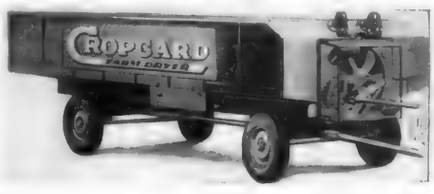
USE YOUR TRACTOR to pull and power this big-capacity Cropgard—the only all-portable farm dryer. Since no electricity is needed, you can safely dry right out in the field. Automatic temperatures and safety controls operate off the tractor battery.



IMMEDIATE DELIVERY—on the job the day it's delivered, it's the best money-maker for custom drying. In one hour, you can dry 100-150 bu. shelled corn, soybeans or small grains. Costs less than 2c a bushel!

TWIN OIL BURNERS give a wide range of drying temperatures. A powerful fan forces a continuous blast through the 170 bu. capacity perforated floor.

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nation of Signs of Zodiac Shown on Weather Chart and Almanac Calendar," we find the following advice:

Dig root crops for seed in the third quarter of the moon. They will keep longer and are usually drier and better.

Grain for future use or seed should be harvested at the increase of the moon.

Avoid the first day of the New Moon for planting, also the days on which it changes quarters.

Harvest all crops when the moon is growing old—they keep better and longer.

Have your hair cut in the waning moon.

Shear sheep in a waning moon.

Don't butcher hogs when the moon is waning. If you do, the pork will shrink in the skillet.

Graft and prune trees in the increase of the moon.

Timber sawed in the full of the moon will be sappy and will soon rot.

Make sauerkraut and cut weeds during waning moon.

THE AUTHOR: After a turn as a reporter on *The Cincinnati Post* and as editor of a trucking trade journal, John Durrell now edits a company magazine for The Union Central Life Insurance Company in Cincinnati. His speciality in writing is auto racing and sport cars. He now commutes to the farm on which he grew up. Five generations of his family have lived on farms in the Cincinnati area. He says, "At least once each generation the town grew, and we had to move farther out. I'm now half-way to Dayton and just about out of places to move."

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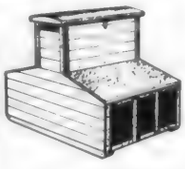
PIG-O-MAT



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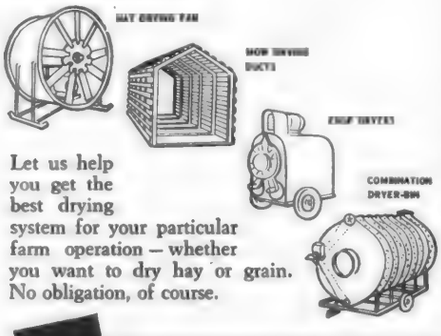

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HOW TO MAKE MONEY ON 12¢ HOGS

(*Continued from page* 41)

best thing I could do to meet the situation was to try to cut the cost of producing the hogs to meet the lowered market price. I had been feeding them a good corn and supplement ration which was fine for good times. For hard times I shifted them to a ration that consisted of three-quarters ground alfalfa, a fifth oats, and the rest supplement. They had minerals before them all the time and I threw in a couple of ears of corn per pig each day. Naturally their rate of growth slowed down right now, but so did the cost of the weight they put on.

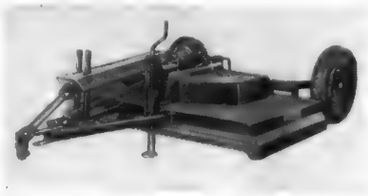
"This year," Fletcher continued, "when prices dropped, I tried an experiment. Ninety-seven pigs I raised the conventional way and a hundred and twenty I put on the hard times ration. The conventional bunch finished up in February and I sold them for $12.15 a hundred. I doubt if I did more than just break even with them. The others will hit the June market. By that time I will have about half as much money in them as I had in the February pigs. Because I didn't have the labor this year to grind the alfalfa, and partly because it is a horrible job, I changed the hard time ration some. This year I have just reversed the alfalfa and the oats so that I'm feeding three-quarters oats, a fifth alfalfa and the rest supplement. I'm also feeding a little more corn this year."

Oddly enough, each year that Fletcher used his hard times feeding system the slower fattening hogs have not reached market weight until prices have risen. In 1952 when he first used the system, his fall pigs were still on their alfalfa feed when the market was down around $15—he sold them in 1953 for $25. This year, his conventionally raised pigs were ready for market when prices reached the bottom of their skid; he hopes to get around $18 when he sells the hard times hogs in June.

"This has been a matter of luck," Fletcher said, "and doesn't have anything to do with the system. I can't count on the price going up, but I can count on my costs going down."

Fletcher admits that the system has some drawbacks. First, the slower fattening hogs are on the farmer's hands longer, which means more labor and the risk of loss due to disease spread over a longer period of time. Second, when you hold your pigs for nine or ten months, it puts a crimp in your whole breeding program. "I figure," he explained, "that a man who followed this program regularly would have to either go to a once a year farrowing or else he would have to feed out his replacement gilts on the old feeding program in order to get them into production on schedule. If it takes ten months to feed out a gilt, she will be

"TOO MANY PEOPLE WANT TO BORROW IT"



That's the only complaint Robert Grams of Maumee, Ohio has about his Wood's Model 80 Rotary Mower-Shredder. He says, "it is very good — our most important uses are in stalk shredding, pasture clipping and shredding potato vines before digging." Other owners have found Wood's PTO-operated Rotaries excellent for low cost land clearing, brush shredding, orchard prunings disposal, grass cutting and leaf mulching.

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Models available in hydraulic lift or drawbar pull-type — easy adjustment from ground to 14" (most models) high. 1, 2 and 3 alloy spring steel blade models — staggered to overlap for cleaner cutting. V-belt drive absorbs shock — shielded PTO and bevel gear drive heavy enough to take tractor's full power. Equipped with 3/16" boiler plate housing, 15" drop center wheels or 8" with non-pneumatic rubber tires. All working parts enclosed.

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around fourteen or fifteen months old when she farrows. The way I did last year was to put all my replacement gilts in a group of ninety-seven that were fed out the conventional way. Now I can breed them to farrow at the usual time. Another problem you'd run into if you used this system regularly and stayed on the two litter a year program would be an overlapping of the two litters during part of the year, which would put a strain on your equipment and labor—I know, I had to cut down on my spring farrowings a little this time.

"There's no question but what the system has its problems," Fletcher concluded, "but it has been awfully comforting to me to know that when the storm warnings are out, I can trim my sails a bit and avoid some of the risk of high production costs and low prices."

The Specialist

Because he likes hogs and hog raising, and because he has a engineer's methodical mind, James McCutchan has developed an production program that has made some observers say, "Study Jim McCutchan's methods and you will get an idea of what the hog farmer of the future will be like." Good times or bad, McCutchan has but one approach—produce in volume with minimum cost. To do this his whole 450-acre farm at Russellville, Indiana, is operated with one objective, to produce 2000 to 2500 hogs a year in a steady economical flow.

Every week of the year, loads of 200 to 225-pound hogs leave the farm for market. Every three or four weeks a new set of 14 to 20 sows goes through his farrowing barns. Three weeks later every sow is weaning 9 to 10 pigs. Every 13 to 14 months every sow has produced three litters. Any day of the year you can find farrowing, weaning, fattening, and marketing activities on the McCutchan farm.

This year there are 228 acres of corn, 44 acres of beans, 40 of oats, and 75 in pasture land which provides pasture area for the hogs and 500 to 600 bales of hay a year. Except for custom combining the beans and oats and baling the hay the farm does all its own field work. And who takes care of the pigs and does all the field work? McCutchan and his one helper, Bob Nicholson. That takes a good system and system is what Mr. McCutchan has.

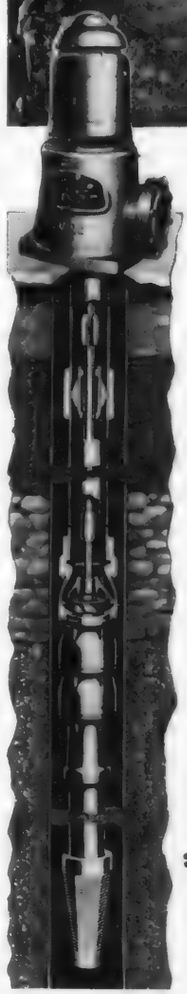
"The thing that surprises most people who visit here," McCutchan said, "is the fact that we run this operation with less than five thousand dollars invested in farrowing barns and other equipment."

The whole program is centered around the farrowing barns. This farrowing center is made up of six Doane-type buildings each of which is formed of two half shelters brought together to form a closed building. One of these buildings is the actual delivery room equipped with eight farrowing crates, the other five are the maternity wards. Each of the maternity ward buildings is divided into eight pens—four to each half building—and each pen is equipped with heat lamp and running water. McCutchan built some of these buildings himself for a cost of $500.

A month before farrowing the sows are brought into a holding lot next to the maternity center where they can be watched and hand fed. Two or three days before farrowing they are moved into individual pens in the maternity wards—two of these buildings will house the 16 sows which form the usual group; when there are more sows farrowing they are put in the fifth building. The sows are watched closely and when milk starts flowing they are moved into the farrowing crates where they have their pigs and remain for three days. At the end of their stay in the crates, they go back to their pens with their litters.

The pigs are given a 22 per cent protein creep feed during the first three weeks; at the end of that time they are weaned on to the Iowa State College prestarter ration, ISC 75. The sows are taken from the pens at the end of the first three weeks and the pigs are held there for another three weeks while they are gradually shifted to a complete starter feed. The pigs are then moved to pasture in the summer or to old horse barns in the winter where they are brought to maturity.

At about the time the sows are being separated from the pigs



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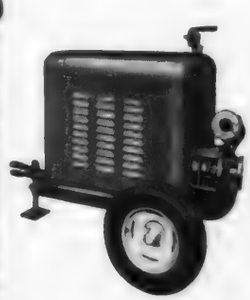

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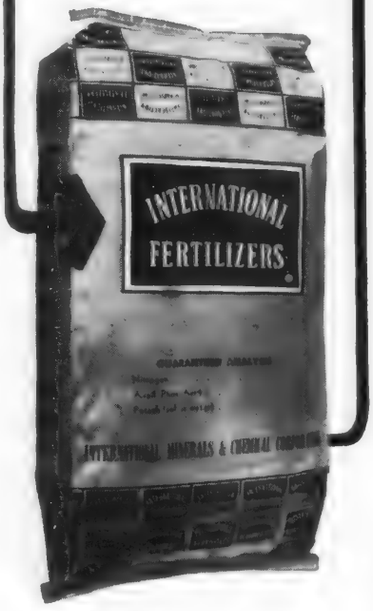

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in two of these maternity ward buildings, a new group of sows is being installed in the other two buildings to start the cycle all over again. After the pigs are moved out, McCutchan usually has a week or ten days to clean up. He cleans by blasting out the dirt with a water spray under 600 to 800 pounds pressure and then spraying the water-whitened boards with a soponified cresylic disinfectant.

There are wheels within wheels in the program that McCutchan has developed. The pigs have their cycle, the sows a different cycle, and the boars still another. When the sows are removed from the pigs they are taken to a holding-lot for a couple of days and held to a ration of water and a little corn to dry them up. From two days of semi-famine they go to a feast of corn, supplement, good pasture, plenty of yeast and mineral mixture to flush them. As soon as any of them show signs of heat, three boars are turned in with them and stay with them for not more than a week. A couple of weeks after they are bred the sow's feed is changed again, this time to hand fed ear corn, free choice minerals, and either good pasture or supplement, depending on the season. This ration does them until they are moved into the holding lot next to the maternity ward where they are hand fed corn, oats, and a pound of supplement a day.

Sows are kept as long as they are doing well and sold the minute they begin to fall off. "As one fellow said," McCutchan admits, "we probably hold them just one litter too long, but I just can't see selling a high producing sow." Gilts are ear marked at two weeks of age if they come from a sow who has raised 11 pigs to that age, gives good milk, and is easily handled. To qualify for the replacement herd, the gilt must have 14 teats and be a vigorous, healthy animal.

As neighbors have seen the production records chalked up by McCutchan's sows —10.7 pigs farrowed, 9.8 weaned—a demand for his gilts has sprung up. He now sells most of the gilts he produces for breeding stock, and at a premium.

As with any farmer who deals in large numbers of livestock, McCutchan is constantly concerned with the danger of disease. "We had good luck right up to last year," he said, "then we were hit. A neighbor brought in some feeder pigs that had bloody dysentery. The branch that runs through his lot runs down through a barn lot and one of my pastures. In the barn lot I had a hundred and sixty-six pigs being fed out and in the pasture thirty-five gilts. I lost twenty of the pigs and spent around five hundred dollars doctoring them. Besides that they were slowed down on growth and we had the bother of changing clothes every time we worked with them. The gilts didn't show any signs of the disease, but I sent them all to market

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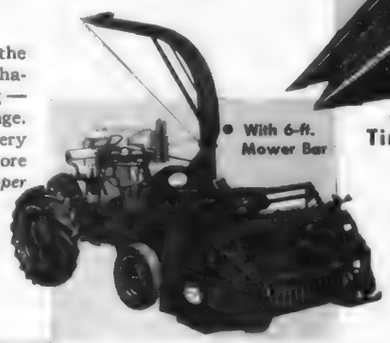

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as a precaution and we haven't used either the lot or pasture since."

In summing up his operation, McCutchan said, "We have been able to hold our investment in buildings and equipment to a very low figure and by farrowing monthly we have been able to get maximum use out of it all. With our continuous farrowing, fattening, and marketing our labor is spread evenly over the year. By specializing in hogs every day of the year, we have been able to raise our averages for pigs farrowed and pigs raised. All of this means that we can turn out low cost market hogs. I am trying to develop the figures which will show how much we have invested in each market hog. I'm not ready to give an exact figure right now, but I will say that in spite of our dysentery losses last year and a generally bad market, we made money even when we were selling hogs at eleven cents a pound."

In the Black or in the Red?

These three farmers, by various means, have been able to stay in the hog business and make a profit in spite of low prices; they have found ways of producing hogs at a cost per pound lower than the market price. Whether that price was 12 cents or 15 cents, they have cut down the cost of production to make a profit, sometimes small, but they are weathering the price squeeze. None of them have

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Farming today is big business—time is money. And only labor saving machines that pull their own load—save you time, labor, and do a job that would ordinarily cost you wages are found on most modern farms.

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DAIRY BEDDING—Wood chips for dairy bedding are highly absorbent and have excellent holding properties. Purdue University says "Shredded wood chips used in bedding tests in the Purdue dairy barn stayed in place better than straw, ground corn cobs, or shavings. Next to straw, chips were the cheapest bedding."

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the rigid and exacting bookkeeping system to say definitely how much per pound their costs are. Like most farmers they balance the black figures in their bank books against the red figures, and if the black figure is the larger, they've made money. Which is about the way most of us operate.

LETTERS

(*Continued from page* 22)

Praise From the Yards

Sirs:

I take this opportunity to sincerely compliment you and your staff on the publication of one of the finest agricultural magazines that I have ever been privileged to read. Truly, your contribution to a better U. S. agriculture is magnificent.

Specifically, I offer my sincerest compliments and heartfelt appreciation to you and author Charles R. Koch for the magnificent article entitled, "Selling for the Top Dollar" appearing in your Spring, 1956, issue. This is one of the best articles on marketing I ever read and is an illustration of the type of adult education and information that our atomic-age agriculture definitely needs for all commodities, livestock and otherwise.

J. D. Sartwelle,
Exec. Vice President
Port City Stockyards Company
Houston, Texas

Fond of Animals

Sirs:

I will be 80 years old in June, but I am as active as a 60 yr. old person. With my youngest son and his family I live on the farm which my grandfather settled in 1848.

I am extremely fond of animals. They have as much personality as folks and show much more sense sometimes. Sheep are my favorites tho I love horses and had many experiences with them in the past before the machine age. My greatest satisfaction is to nurse a sick or injured animal back to health, sometimes with aid of a vet, but usually just myself.

I've delivered many calves and lambs and raised many orphans. Just now I am raising 4 little pigs by hand. No animal has ever de-

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liberately tried to hurt me and they are always so grateful for help. I especially liked the article in the last issue of THE FARM, "Kindness Pays."

Mrs. Bessie Greeley

Bittersweet Farm
Sherwood, Michigan

No Hybrid Hogs

Sirs:

You can do many farmers and feeders a big favor if you will denounce hybridization as usually practiced in swine. You know very well that most farmers think that if a little is good a lot is better. In the case of livestock hybridization soon produces scrubs and mongrels. The Duroc folks have taken a shot at it, but you can do even better. First generation crosses may be good but . . .

You must know how emphatic producers of hybrid corn are against planting seed from the previous crop. Enough Said.

W. A. Gardner

Auburn, Alabama

Weather Makes Characters

Sirs:

Congratulations to you on your 10th birthday. We've been a subscriber almost that length of time and we really like having a beautiful, outstanding farm magazine come quarterly. We find that you now publish more articles of interest and use to us in our section than you did in the beginning and we like that.

Since we moved to our farm five years ago, we've not had a year of average rainfall—it seems that most of our problems could be solved

RANGER
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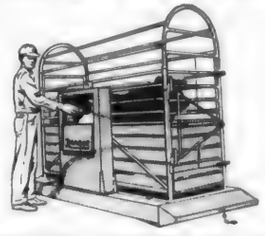
"Weigh them where they are"



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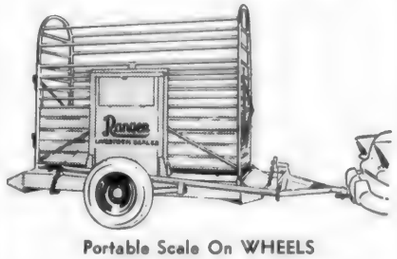

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Important also are the Tokheim electric gasoline pump (2), and the new sprayer-compressor (3). Placed in and adjacent to a service shed they provide a *quick* and *safe* source of fuel and air for inflating tires, lubricating, cleaning, spraying, painting. Thousands in use giving satisfactory service. See your oil company, your Tokheim representative, or write factory.

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PITTSBURGH
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PITTSBURGH VULCAN RODERICK LEAN HARVEY

—the quality line of tillage and materials handling tools

if Mother Nature would just start taking care of her own. Well, not quite all, because the last two years our fertile, farming community of Hamby, 7 miles distant from Abilene, has been threatened by the announced intention of this city to take 2000 acres from its farm owners while converting its own 1200 acre sewer farm into a park. Do cities in the middle west destroy their best agricultural land in this manner?

The joys of the farm are many and real though: to see grass coming back on bare pasture, brought back during drouth by using conservation methods (think what we could do if it rained); to watch those white-faced calves getting better all the time through better knowledge and care of the herd; to learn how important neighbors are when they're few and far between. Yes, despite the drouth, we vote to live in the country. They say adversity builds character, maybe it's the weather which causes Texans to seem such characters.

Kathryn Downs
(Mrs. John F. Downs)
Upsan-Downs Stock Farms
Abilene, Texas

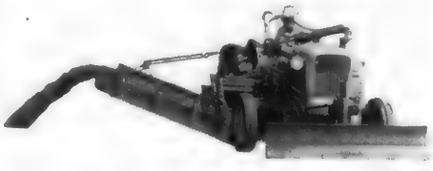
How the Terracer Works

Sirs:

Please give me all available information on how the Tumaco Terracer shown on Page 83 of the Spring issue works.

Archie Monfort
Columbus, Georgia

It works fine, users report! For terracing (see photograph) the dirt is handled only once. A large revolving disc blade is located between the front and rear wheels of the tractor. This requires little power to operate and it cuts the dirt and throws it to the conveyor belt which is



designed so that it will deliver dirt about thirteen feet away from the furrow.

In the caption underneath the photograph in the Spring issue we erroneously reported that the dirt was cut loose by the bulldozer blade on the front of the tractor.

Gray Kegs of Nitroglycerine

Sirs:

I greatly enjoyed reading Miss Johnson's article on "The Ladybug."

The private lives of insects are interesting to me, not only because I want to know which ones may hurt or help my garden, but because it delights me to see such intricate structure on a microscopic scale, and to observe the similarity of their instincts to our own.

In bug-time I use a magnifying lens, and last summer I got so well acquainted with my garden's denizens that I was almost afraid to gather my vegetables in.

The most intriguing little midget of all was one which laid its eggs on the green shell of a calico lima. I focused my glass on this cluster and held my breath, enraptured. There were about fifteen beautiful little pearl-gray barrels, closed with convex heads, each closure sealed with a perfect circle of infinitesimal beads, unevenly sprinkled with gold dust. Oh, I thought, what a marvelous little creature this must be; what an amazing sense of beauty it must have, to make such lovely eggs! I kept the bean-hull under a screen cover and examined the eggs three or four times a day, eager to see what the

For GREEN FEEDING or SILAGE it's the M-C CHOPPER

One man operation. One minute hook-up. Lets you get dry hay — hay for green feeding or silage. Use the year 'round for straw or stalks, for bedding.

"Loads the heaviest crops"

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Lightest Weight (Average wt. 276 lbs.)
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Our prices have not increased despite increased material costs.

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Hydraulics Limited Mfg. Co.
P. O. Box 207, Eaton, Colorado - Phone 81

progeny would look like. Days passed with no visible change. I grew impatient and began to wonder if the eggs could be dead or infertile I decided to break one, very gently, and see how it looked inside.

That tiny, delicate-looking thing was about as easy to break as a solid glass bead would have been. I finally crushed it and its contents without learning anything more; but a few days later there were two or three empty shells with holes gnawed through from the inside. The hatch had escaped and gone out for dinner. I watched the remaining eggs closely and saw what they were producing—mean-looking little black critters, resembling small winged ants. My thought now was: Save me from the bite of an insect able to gnaw through a shell as hard as this! I soaked the cluster with fly spray and burned it just to make sure.

Next day I found one of the escapees, his tiny legs caught in the tangling nap of a bath towel. He was, it seemed, in a demoniac temper, spitting fire and brimstone in a way to make me wonder who drew the blueprints for his disposition. He was simply berserk with rage, fright and frustration, and if we could have understood his language, I don't doubt we should have learned bad words heretofore unheard by human ears. I put a speedy end to him, but I am waiting apprehensively to see if there will be more such beautiful little gray kegs of nitroglycerine, looking like pearl beads touched with gold, on my bean vines this summer. If there are, here's where I start wearing armor.

Mrs. Katie M. Reis
Vanceburg, Kentucky

Likes Capehart Bill

Sirs:

If you'll secure a copy of Senator Capehart's bill (S. 3503) you'll read the most intelligent legislation ever to be considered by the Congress pertaining to agriculture. If this legislation is to become a law this session of Congress it is going to take action by all of us.

The FARM QUARTERLY has an obligation to all subscribers and advertisers to lay the facts before them and ask them to write their Congressmen and Senators their views if they approve of this bill becoming a law.

A. K Mayer
LaCebadilla Ranch
Tucson, Arizona

Editor's Note: The bill provides for a commission to explore new uses for farm commodities in industry; especially surplus crops. Farmers and those who know the farm situation believe this is one of the most intelligent approaches to surpluses yet devised; and in the end it will pay for itself.

OVER THE BACK FENCE

(*Continued from page* 8)

families. And how is this to be done? The Committee throws the problem into the laps of politicians, just where it is now.

There is a strange, impersonal, detached tone to the report. It never quite gets down to where we can smell manure or hear a calf bawl for its mother. Perhaps the reason is that of the 100-odd great minds on the Committee, not one is a farmer.

Big Apple A rare variation of the Winesap apple tree—a tetraploid plant with double the normal number of chromosomes, tending to produce extra-large apples—has been developed by the U. S. Department of Agriculture plant breeders at Beltsville. This unusual tree, the scientists hope, will provide new breeding stock that may help growers produce large-size apples having the high quality and disease resistance of the Winesap. The new tetraploid apple originated as a bud sport—that is, a branch with different chromosome make-up—found on an otherwise normal Winesap tree.

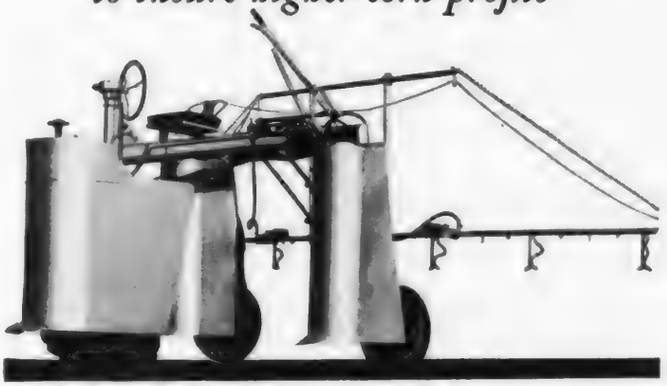
Dutch Invent Milk-Fruit Drink Scientists in the Netherlands have invented a new milk-fruit beverage. The Dutch have found a successful method for mixing acid fruit juices with milk, making a colorful pasteurized drink. It will keep for several days like milk or, if sterilized, for several months. The new drink provides new opportunities in promoting greater use of both milk and fruit.

The secret in the preparation is a substance known as pectin. By using a very high grade of pectin, mixing it with milk and sugar and letting it stand just long enough for the pectin to throw a protective coat over the homogenized milk molecules, acid fruit juice can be added without coagulation.

You might like to try one of the recipes. Just dissolve 20 pounds of sugar in 46½ quarts of fresh milk. Then add and mix 23 quarts of a solution containing 2½ per cent pectin preparation. Let the mixture stand for a few minutes and then add

2 BIG WAYS

to insure higher corn profits



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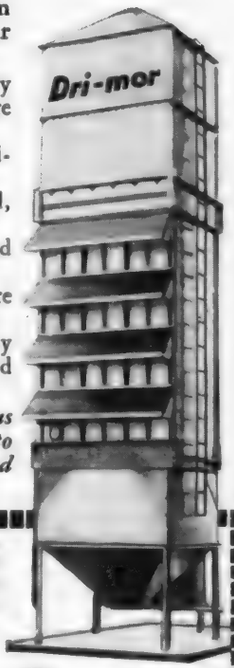
And...the Finco Dri-Mor has many exclusive features to assure lower maintenance and operating costs.



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19 quarts of black current juice. Let stand for 10 minutes and pasteurize.

No Spik Engleesh Pity poor editors—apparently they all have the same troubles in their efforts to make their articles understandable. Editors must depend a good deal on scientists for facts about farming, but when they expect scientists to reduce those facts to readable English they expect too much. Sir James Scott Watson, editor of the brilliant English farm magazine, *The Agricultural Review,* puts the problem in a nutshell:

A movement is on foot to induce scientists to deliver themselves in language that shall be more readable and more easily understandable by plain folk. Dr. Baker recently led the attack in *Nature* and had the support in a pungent editorial. The *Sunday Times,* having offered attractive prizes for essays on scientific subjects, with a wide choice, declined to make an award. In the view of the judges, none of the forty-three efforts was written in a way that could be expected to appeal to the general reader. Various other people are ganging up to demand action.

It is generally agreed that the trouble is not only, and indeed not mainly, the use or overuse of out-of-the-ordinary words and phrases. In the main it is the writing of "plain bad English." One possible explanation is that, in these days of extreme specialization in school and university, the budding scientist has no time to learn his own language. Another is that the scientist despises the rest of us, and could not care less about making himself understood by any but his own class.

On the whole, we ourselves have no very great cause for complaint, but we have been in trouble off and on for messing about with our contributors' scripts. Perhaps the best prescription for those who need treatment would be a short course of reading. It might include Huxley's *Essays,* Hogben's *Science for the Citizen,* and, in our own field, perhaps Daniel Hall on *The Soil* and Salisbury on *The Living Garden.*

Lysenko Purged T. D. Lysenko, president of the Russian All-Union Academy of Agricultural Sciences, has been booted out. His pet theory that evironmental experiences could change heredity was rammed down the throat of the Russian people because Stalin liked the theory. Russian agricultural science has been based on Lysenko's theories since Stalin rose to power and the world's scientists agree that it will take a long time to undo the harm and unteach the theory to Russian farmers. Russian propagandists are busy making Lysenko over, in the Stalin technique, into a devil. Taking Lysenko's place is V. V. Matskevich, whose theories are more in line with those of the West.

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The new Model 336 *Farm'n'Field detachable-tank unit* is the last word in portable air compressors. Working pressure 100 lbs. Takes only five seconds to disconnect stainless steel tank. Filled tank weighs less than 20 lbs. . . . easily portable in emergencies. Inflates tires, operates grease guns and blow guns, sprays paints, etc. 10-inch rubber tired wheels. *Bigger compressor . . . delivers more air in less time!* ½HP motor. See it at your dealer or write for literature to THE CAMPBELL-HAUSFELD CO., 181 Railroad Ave., Harrison, Ohio.

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R. L. FROHRING MACHINE CO., Box 23, Newbury, Ohio

(*Continued from page* 26)

to be stepped up with a small amount of supplement for maximum production.

Analysis of the hay indicated it contained 20.20 per cent crude protein, 28.30 per cent crude fiber. The silage contained 6.63 per cent crude protein and 21.66 per cent crude fiber.

"With forage of this quality," McCullough says, "a 1000-pound cow consuming 2.5 pounds a day per 100 pounds body weight has a potential of maintenance and 20 pounds of 4 per cent milk. Consuming 3 pounds she could be expected to produce 29 pounds of milk; 3.5 pounds, 38 pounds of milk and 4.0 pounds, 47 pounds of milk. We have repeatedly shown this to be true in our herd.

"At a 45-pound level of production on her high day in lactation, a cow could be expected to produce about 9000 pounds of milk during her 305-day period. For a larger cow, such as a 1400-pound Holstein, the corresponding rate of production on roughage at 4 pounds per 100-pounds body weight would be about 11,000 pounds."

To tie it all up in good, hard dollars and cents language, McCullough concludes that "such feeding practices should leave a feed cost per hundred pounds of milk of not over $1.50. Many months, when the cattle are on pasture, it could be even less than that."

Watch Those Worms

Even if the government could soften all the knocks of the marketplace for the farmer, there would still be the bugs and worms to cause him trouble. And worms, particularly, seem to be becoming more aware all the time of the pleasant living to be found in the innards of cows and calves.

Delmar Young, Extension Dairyman at the University of Delaware, recently warned dairy farmers of that state to be especially vigilant for symptoms of worms in their young stock. Dairymen the country over would do well to heed this warning. Lack of thriftiness, loss of weight, paleness of the eye membranes, potbelly, and possibly a soft swelling under the

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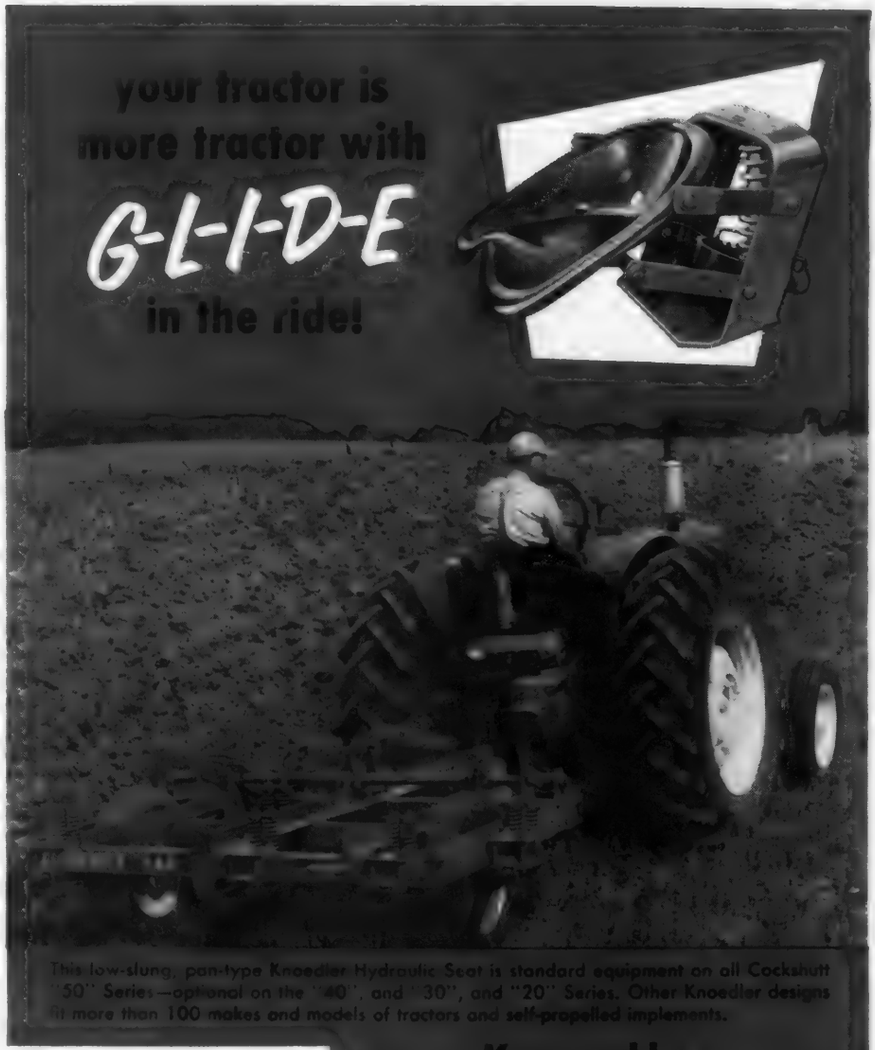
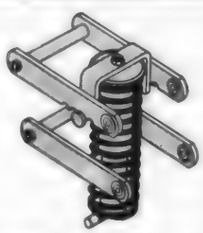


This low-slung, pan-type Knoedler Hydraulic Seat is standard equipment on all Cockshutt "50" Series—optional on the "40", and "30", and "20" Series. Other Knoedler designs fit more than 100 makes and models of tractors and self-propelled implements.



Knoedler's special spring-hydraulic action "kills" the jolt and absorbs rebound for a controlled, safe ride. The hydraulic shock absorber is inside the spring and both adjust instantly with selective notches. Parallel arm action keeps seat always level as it glides up and down. Protected by U. S. Pat. No. 2432554 and 2531572.

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jaw are the usual signs which betray the presence of worms. These may show up despite the fact the calves are eating well and have a good appetite.

A good worm preventive program is three pronged:

1. Rotate pastures. Young cattle that graze steadily on old permanent pastures are more likely to have worms than those on rotated pastures.

2. Clean pens and shelters frequently and disinfect them.

3. Keep all feed boxes clean.

If, in spite of these precautions, a farmer is suspicious that his cattle are infested, his best move is to call his veterinarian. The vet can make a microscopic examination and come up with a definite yes or no answer so far as the worms are concerned. If the answer is "yes" a strong dose of phenothiazine in capsule form will probably be prescribed. The capsules are put down the throat of the calf with a balling gun that fits the capsule.

Normally, a single strong dose in the spring and another in the fall is sufficient, though in severe infestations a second strong dose may have to be given about three weeks after the first one.

Low-level feeding of phenothiazine in the salt added to the grain ration provides good protection against possible infestation. As an alternate to introducing the phenothiazine in the grain ration, Young advises mixing it in the salt fed free choice to the cattle. A pound of phenothiazine to 14 pounds of salt is the correct mixture. The phenothiazine should not be fed to milking cows.

THE FARM'S PICTURES

Cover by Grant Heilman

The photographers represented in this issue are: 32—(bottom)—Rosario Casella. 32 and 33—Silvio Peluffo. 34—Rosario Casella; Drawing by Fred Eichenberger. 35 and 36—Rosario Casella. 37—R. J. McGinnis. 38—Chart by Prof. C. W. Turner, Univ. of Mo., Courtesy of Babson Bros. 39 and 40—Joe Munroe. 41—Grant Cannon; Kazik Pazovski. 42—Massey-Harris Div., Massey-Harris-Ferguson, Inc.; Minneapolis-Moline Co. 43—Deere & Co. 44 thru 47—Robert B. Goodman. 48—Joe Munroe. 49—Joe Munroe; Mike Rivise. 50—Gordon Hawkins; Valley Mfg. Co.; Bureau of Reclamation. 51—Chart by Fred Eichenberger; Photo, W. R. Ames Co. 52—Bob Taylor. 53—Joe Munroe. 54 thru 57—Robert B. Goodman. 58—Grant Cannon. 59—Photo, Grant Cannon. 59 thru 62—Engineering Drawings by Norval H. Curry. 63—Grant Cannon. 64—Robert B. Goodman. 66—Fred Knoop. 66 and 67—Detroit Free Press. 68—Detroit News. 69—Grant Cannon. 70—Chart by Fred Eichenberger. 71—J. C. Allen & Son. 72—Edward R. Ross; A. H. Baumhover, USDA Entomological Research Branch, Orlando, Fla. 74—Univ. of Wis.; Cashore & Co.; DuPont; Fred Knoop. 75—Entomology Research Branch, Agricultural Research Service. 87—Robert B. Goodman. 92—Robert B. Goodman. 100—Fred Knoop. 103—Illinois Natural History Survey. 120—R. J. McGinnis. 146—Fred Knoop.

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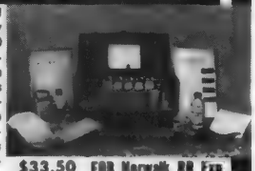

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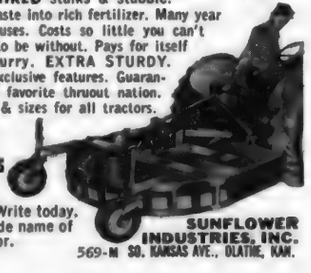

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FARM BOOKS

(*Continued from page* 116)

absorbing. One reading of Amateur Beekeeping won't make a man an apiarist but it will give him the urge and the minimum know-how to start with a few bees.

Farm Soils, Their Fertilization and Management, *by Edmund L. Worthen and Samuel R. Aldrich. John Wiley and Sons, Inc., New York, $4.96.*

This is the fifth edition and a complete revision of a work originally published almost 30 years ago. At first glance it appears to be just another text book on soils. But when the reader begins to concentrate on the text he gets a bit of a surprise. "This is soil," begins the first chapter. "Without soil you couldn't live." And this informal, second person approach is carried right through the entire 14 chapters. Those with a broad background of training and experience in soils and crops may be just a little annoyed by the elementary style in which the book is written; but they will undoubtedly be among the first to recommend it to those who need a working knowledge of soils rather than a technical knowledge.

To localize their approach and make it as practical as possible, the authors—both of the staff of Cornell University—have confined their attention to the 22 northeastern states, extending as far west as Minnesota, Iowa, and Missouri, as far south as Kentucky and Virginia. The soils and crops of this region they cover with considerable detail.

Soil tilth is given particular emphasis, the authors contending present-day farmers are seriously handicapping themselves by continuing to work up the same kind of seedbed they formerly prepared with horsedrawn equipment. The plowman's capital sin, as they see it, is overworking the soil.

The farmer who has been hard put to distinguish between such fertilizers as ammonium nitrate, nitrate of soda, ammonium sulfate, urea, solution 2A and the various other compounds that have appeared in recent years will be delighted with the simple diagrams included in the section on fertilizers showing the ingredients which go into these mixtures and how they are put together.

Organic matter, "the life of the soil," is treated with the same thoroughness and with the same kind of graphic presentation as are the commercial fertilizers.

Another very helpful feature is a complete listing of all the currently popular soil fitting implements—everything from the plow to the rotary tiller—with a discussion of their adaptability to various soil types and field conditions.

The use of lime to correct soil acidity, farm manure, water management, the handling of muck and peat soils, rotations and special suggestions for growing individual crops are among the wide range of subjects which come in for treatment. With such a line-up this new edition of *Farm Soils* seems a good bet to become the most dog-eared item on many a farm bookshelf.

The Range and Pasture Book, *by R. L. Donahue, E. F. Evans and L. I. Jones. Prentice-Hall, Inc., Englewood Cliffs, N. J., $5.60.*

Donahue, Evans and Jones are all good Anglo-Saxon names and it is doubtful that their bearers boast any trace of an Arabic background. Still, the authors of this latest of the rash of works on grasses and grassland farming have distinguished their volume by the application of the old Arab proverb, "When you shoot an arrow of truth, dip its point in honey."

With its hundreds of illustrations and charts, its attractive layouts and beautifully designed covers featuring kodachrome reproductions of grassland scenes, *The Range and Pasture Book* is the glamour book of grassland literature. The honey runs a good way past the tip of the arrow.

Best of all, the beauty is more than skin deep, for here is practical advice, clearly and simply stated on every phase of range and pasture management. The usual information on the varieties of grasses and legumes is well integrated with specific advice on a regional level for their use.

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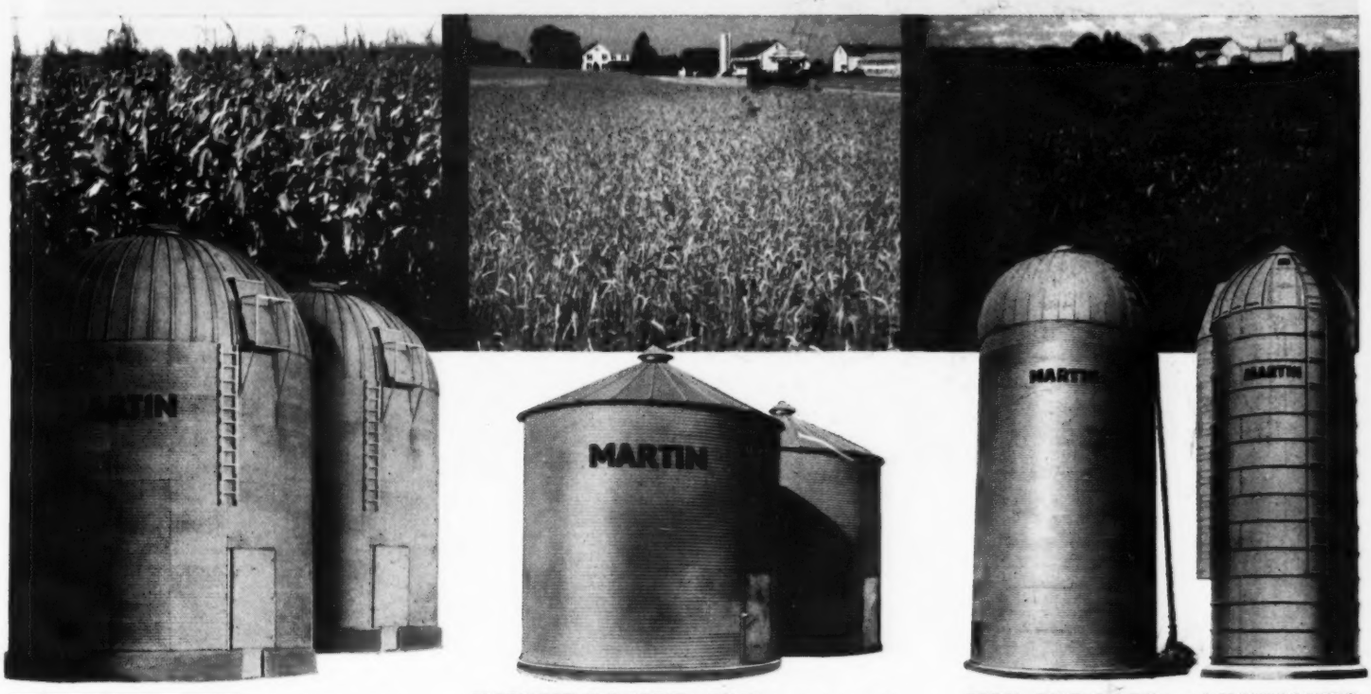

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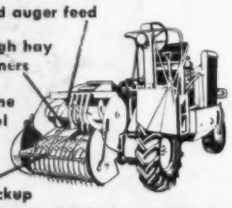

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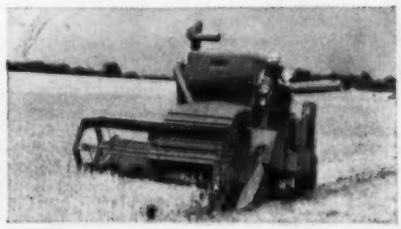

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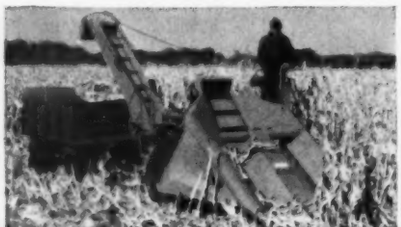

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